The Plough, the Loom, and the Anvil.

VOL. II. OCTOBER, 1849. No. IV.

HEAR BOTH SIDES.—No. III.

——, *South Carolina, May* 15, 1849.

* * * WITH the eminently scientific character of your "Farmers' Library and Journal" I was much pleased, and have carefully preserved the numbers for binding. Published in the region of the North, it was not to be expected that its practical details would be so well suited to the planter of the South. The Northern farmer may furnish him with many useful hints, particularly in domestic economy; but the scientific features of "The Library and Journal" rendered it emphatically of universal value. And to supply the deficiency in practical details suited to my planting operations, I looked to "The Southern Cultivator," published in Georgia.

When you supplanted "The Library and Journal" by "The Plough, the Loom, and the Anvil," I was induced, by a personal acquaintance with you of pleasant recollection, and by a high respect for you as a veteran in the service of agriculture, to give your new effort a trial. The proximity of the plough, the loom, and the anvil, I thought important and desirable for the sake of diversifying labour, and the *mutual* aid the respective pursuits would contribute. Even in our Southern States best adapted to planting, there will be a considerable portion of the population, from bodily infirmities, distaste for the employment, and occupancy of unproductive lands, yet abounding in water-power, timber, and other advantages, who cannot pursue agriculture successfully. The diversity of labour which such circumstances would naturally promote, to the advantage of this portion of the population, is important in subserving the interests and fuller development of agricultural resources. But if these advantages are not the result of natural circumstances in a natural way, but are to depend upon an artificial propulsion, for which agriculture is to be taxed, then it is to be feared, that even in fertile planting regions, where it has attained to so high a degree of success without such aid, agriculture will become only the incident. Just as it has occurred, my much respected sir, in your conduct of "The Plough, the Loom, and the Anvil." You have, indeed, delusively to yourself and your agricultural friends, placed the plough at the *head* of the catalogue; but *that* is its chief prominence. For the experience of a year has opened our eyes to see the loom not only central in position, but how dexterously you are bringing the *plough* as well as the anvil to its aid. Without the plough and the loom there would be little need of the anvil, and it will naturally take its place along side of each. So would the *loom*, seeking the material for its operations from the plough, naturally take place by its side. It presents an inviting argument to the enterprising. But the exigencies of regions where agriculture is not so remunerating has demanded the loom, and the argument has been unheeded, and will be, till over-production drives the planter to the consideration of this and the other argument suggested at the outset for the diversity of labour. That period has at length arrived, and will bring about the desired result without any unnatural stimulus. I have visited the most flourishing manufacturing towns and villas at the North, and no similar scene exhibited to my mind more forcibly the externals of prosperity than was presented in my visit to Graniteville, in this State, the other day. The extensive factory building of granite, the comfortable and tasteful houses for the operatives, the neat church edifices, &c., all so well and spaciously arranged on streets set out with trees, was indeed beautiful. Correctness of character, and industry, are indispensable qualifications in the operatives; and education is provided for the children of families engaged about the factory. Indeed flourishing factories are springing up in various portions of this and other Southern States. Here is your problem working itself out naturally to a profitable and successful issue, *without* the tariff of 1842. The plough, the loom, and the anvil, are dwelling peaceably and profitably together as coadjutors and friends. Would you turn one of them into a blood-leech, and disturb the present tranquillity? I will not dwell upon the injus

tice of taxing the plough—for it amounts to that—to protect other branches of industry; which policy you are sustaining under the delusive idea of its associating the plough, the loom, and the anvil, to the ultimate advantage of the plough. I cannot believe that you are an enemy in disguise, when you have done and sacrificed so much to evince your honest attachment to the plough. You will find, however, that the mass of your Southern agricultural friends consider your views mistaken—as infringing upon natural justice and constitutional rights—injurious to the great cause you advocate, and an impediment in the way of the agreeable and successful association of the plough, the loom, and the anvil. It is to be regretted that you sought to promote so desirable an end by the avowal and advocacy, in your journal, of the principle of protection. However free you are to entertain your political opinions, it was unnecessary to render your course obnoxious to any branch of your friends, especially in the department of agriculture to which you are principally attached, by giving your journal a political complexion. You were aware of the contrariety of views on the disputed point. And it would seem much more consistent with the design of your journal, had you confined your course to information in the science and practice of the respective departments. But you have undertaken through it to promote a political principle, which is held by many not only of doubtful policy, but a political heresy.

Your course, however, is adopted, and I judge from your last number, will be persisted in. I do not presume to hope to swerve you from it, and you will excuse me with these views I respectfully present, for declining to be any longer a subscriber to your journal. Please stop sending to me after the present volume, "The Plough, the Loom, and the Anvil."

Yours, very respectfully, ——— ———

We know not how we can more fully manifest our entire confidence in the truth of our doctrines, than by laying before our readers the arguments of those who are induced, whether by political calculation, or by honest difference of opinion, to furnish us, either publicly or privately, with criticisms upon the lesson we have undertaken to teach, viz.: that the farmers and planters must open their eyes to the fact that they have been and are being impoverished, and their lands are becoming exhausted, because of sending from the land all the products of the land; and that if they would prosper, they can do so only by aid of measures calculated to bring together the plough, the loom, and the anvil, now unnaturally separated.

We have on hand several letters from our Southern friends, declining to continue their subscriptions, and containing views somewhat similar to the one above given, and would gladly publish the whole of them, with our comments thereon, but the very limited space that can be appropriated to the discussion of such subjects, prevents our adoption of that course. We now select this one, because we regard it as the best in point of argument, and because its very friendly character will be proof to our readers that it is the product of an honest difference of opinion, and therefore, unlike some others, not to be charged to political calculation. It is always to us a matter of exceeding regret to lose a reader like the author of this letter. We say reader, not subscriber, for though dependent upon, and therefore anxious for, the success of this journal, our first desire is that of disseminating sound information, that we believe must conduce to the prosperity of that great farming and planting interest with which we have been so long and so closely connected.

Not less is it a matter of surprise that such men should voluntarily close the door to information that might enable them to review, and thus either correct or confirm the views they have hitherto entertained. If what we have to say carries with it no conviction of its truth, it can do no harm to them or others, but must, on the contrary, in their estimation, do good, by confirming them in the belief hitherto entertained, that the more they can send from the land, returning to it none of the refuse of its products, the richer they will grow. Why, then, should they not read? Why not "hear both sides?" Why limit themselves to the perusal of *The Union*,

and the letters of *Bundelcund*, and the Patent-office Reports, and the Reports of the late Secretary? To them, those papers and documents can convey no information, as they merely repeat what must have been known before.

Were all men to follow the course of the friend who writes this letter—were all to discontinue reading books so soon as they discovered that they contained new ideas in religion or morals, in physical or economical science—or that the writer entertained views different from their own—what chance would there be of human improvement? It has been well said by an eminent writer of our own time, that

"Every one must of course think his own opinions right; for if he thought them wrong, they would no longer be his opinions: but" that "there is a wide difference between regarding ourselves as infallible, and being firmly convinced of the truth of our creed. When," he says, "a man reflects on any particular doctrine, he may be impressed with a thorough conviction of the improbability, or even impossibility of its being false: and so he may feel in regard to all his other opinions when he makes them objects of separate contemplation. And yet, when he views them in the aggregate, when he reflects that not a single being on the earth holds collectively the same, when he looks at the past history and present state of mankind, and observes the various creeds of different ages and nations, the peculiar modes of thinking of sects, and bodies, and individuals, the notions once firmly held which have been exploded, the prejudices once universally prevalent which have been removed, and the endless controversies which have distracted those who have made it the business of their lives to arrive at the truth; and when he further dwells on the consideration, that many of these his fellow-creatures have had a conviction of the justness of their respective sentiments equal to his own, he cannot help the obvious inference, that in his own opinions it is next to impossible that there is not an admixture of error; that there is an infinitely greater probability of his being wrong in some than right in all."*

Our course is, and shall be, in direct accordance with these views. We seek not victory, but *truth*. We read the arguments of our opponents, and we weigh them, and what is more, we print them, and so shall we continue to do. Let our opponents offer us sound arguments—such arguments as should convince us that we are wrong—and our error shall be instantly acknowledged. We invite discussion. We state facts whose existence is undeniable, and yet totally incompatible with the truth of the doctrine that teaches our planters to exhaust their land in producing cotton to be sent abroad, when they might enrich their land and themselves by surrounding themselves with a great consuming population, engaged in the conversion of cotton into cloth, and we ask an explanation of them, yet in vain is it asked. In reply, we receive a mere repetition of assertions, and the reason that such is the case, is, that the men to whom we have referred, and who have set themselves up for the great politico-economical teachers of the nation, have no knowledge of the subject but that which they have drawn from books, and are entirely unable to furnish an explanation of a fact unless they can find it in those books. They rely on their memory for their arguments, and as a necessary consequence are generally obliged to resort to their imagination for their facts. They are blind guides, and the sooner our agricultural friends shall determine to see for themselves, hear for themselves, and think for themselves, the sooner will they relieve themselves from the necessity of resorting to combinations for diminution in the product of cotton, replacing it with food, *at a moment when we are assured that our present surplus of food is so infinitely great that had we the supplying of all the consumers of England, it would not be sufficient for its absorption*. Really, when we look at these things passing around us, we are amazed that there does not arise among our planting friends an universal

* Essay on the Publication of Opinions, Section V.

conviction that there is something wrong, and an universal desire to endeavour to know what that something is, accompanied by a determination to "hear both sides," and then judge for themselves, instead of blindly following in the track of men as fallible as themselves, many of whom have proved their fallibility by their advocacy of extreme opinions on both sides of the same question, at no very distant periods of time.

Our correspondent admits that South Carolina has labour power that is unemployed, and that must so remain for want of diversity of employment, and that she has water-powers that are unemployed, which, if employed, would bring the labour power into action; but he thinks that if that employment is to be brought about by "artificial propulsion," agriculture may be taxed for the support of the labourers. But is not agriculture now so taxed? These people eat and drink, and consume clothing, and occupy buildings intended to shield them from the weather, and *somebody* finds them all these things. They cost the community, while doing nothing, precisely the same as if they worked; and they now produce nothing in return, whereas they would then produce something.

He thinks, however, that employment for surplus men and women, and children, and water-power, and rich soils, will come of itself, and without artificial aid, and points to "Graniteville" in support of this view of the case. We also point to "Graniteville" as evidence of what might, and would long since have been done, and of what would not now have been done, but for the total failure of the free-trade system which preceded and led to the adoption of the tariff of 1842. To that tariff is the existence of that village due, and what have been its effects in producing a demand for labour that before was waste, and thus enabling men and women and children to become better customers to the farmer and planter—the producers of food and of the materials of clothing—may be seen by the following passage, which we take from a very interesting letter on Southern manufactures, in "The New York Herald:"

"The effect of the erection of this manufactory in the neighbourhood, is almost magical. Hundreds have found employment among the poor of the white inhabitants, who were, before, almost destitute. A Methodist and a Baptist church have been erected. A free school has been opened, and about 70 pupils attend. There is a large and convenient hotel, where I am writing this letter. The town is laid out in streets, and already over 80 dwelling-houses, very neat and comfortable, with gardens attached, have been put up, which rent from $16 to $25 per annum. The girls in the factory are, some of them, very pretty, and are well dressed; and, from what I can learn, the change in their appearance is extraordinary. The superintendent, Mr. George Kelly, who came out here and placed the factory in operation, went with me through the manufactory and town. He informed me that he only brought with him four or five experienced persons from the North—all the rest in the factory, about 300, men, women, and children, are from the Sand Hills and immediate vicinity, where they, one year ago, were earning nothing. They make now from four to five dollars, (males,) females from three to four dollars, and children one to two dollars per week. Some of the girls, who are now well dressed and appear very intelligent, a year ago were at work in the field, hoeing corn, or ploughing with a horse; others were idle; now they reside in comfortable boarding-houses, where they pay $1·50 per week for board, and can lay up money. Their education is attended to, and they are on the road to become useful and productive citizens. In fact, since Christmas, over forty marriages have taken place between the young male and female operatives in the factory. They were brought together in it, became attached, and got married. In such a case, the wife generally leaves the factory to attend to the housekeeping arrangements of the new couple, and the husband continues in the factory, which gives them an independent support."

No one who reads this can doubt that the moral and physical condition of the people is improved, and that the State is enriched and strengthened by the existence of this admirable establishment. Why, then, does it stand

alone? Why are there not such in every county of the State? Is it for want of population? Certainly not. There are tens of thousands of poor white people who have scarcely been able to obtain employment sufficient to give them the poorest subsistence: and tens of thousands of slaves, unable to work in the field, who are a burden to their owners, while hundreds of thousands of whites and blacks have left the State, often abandoning their land because unable to sell it, all of whom might have remained at home, clearing and cultivating the rich lands that are yet untouched, had not South Carolina so absolutely repudiated the doctrine that leads to the consumption on the land of the products of the land. Has it been for want of capital? Certainly not. The people of that State were among the largest stockholders in the Bank of the United States. *They sent capital abroad in search of employment that was denied to it at home.* The *Charleston News* tells us that even now, when the planters have for so long a time been selling their products at little more than the cost of production:—

"Much larger aggregate amounts of capital lie dormant in the hands of their possessors, in rural districts, than is imagined. Let" (says the editor) "the inducement be once presented, and the combination of capital would be no more difficult than the combination of labour. Here, then, would be presented the true field for philanthropic labours. A white population that is scattered, uninformed, devoid of material comforts, may be concentrated, instructed, taught to estimate at its due value regular employment, if there is not a taste imparted for some of the luxuries of life, and even an elevation given to the standard of enjoyment, physical and intellectual. The arts of manufacture, when they come, as they must come, to be associated with the mechanic arts, their handmaids, will enlarge the sources, almost indefinitely, of stable and profitable occupation. We contend that for every one hundred white persons that we can put into a factory, we proportionably augment the riches of the State, without subtracting one iota from its agricultural resources, besides reclaiming from the waste of moral darkness those who have minds to be illuminated and principles to be fixed."

The reason why these things have not long since been done, has been that they could not be done. During a long period, there has been a constant oscillation, backwards and forwards, between protection and free trade, attended with ruin to almost all who endeavoured to bring the consumer to take his place by the side of the producer, and *it has not been until now, after so many years of experience, that the protective system has been so fully established as to have it admitted by free trade advocates, that a revenue duty means thirty per cent., and nothing less.* The South Carolinian has a duty of thirty per cent., which he deems sufficiently protective, and that duty having been established by his free-trade friends, he thinks it likely to be permanent, and *therefore he builds a factory*, and this he calls the triumph of free trade! Abolish the duty to-morrow, and establish free trade with Europe, and the factory would disappear, for the market would at once be crowded with cheap and worthless clothing, that must be sold, and the manufacturer would find no demand for his products.

This, however, is but one of the consequences that would result from such a course of action. Whence came the improved machinery of Graniteville, and whence the skill to manage it? From New England. And how got it there? England prohibited the export of machinery and of artisans, that she might *compel* her colonies and the nations of the world to send to her their raw materials, and thus enable her to tax them at her pleasure, and the people of New England were compelled to *smuggle* out both artisans and machinery, that they might commence the work of manufacture. So did the nations of Europe. They and we then became manufacturers of machinery, and thus compelled England to permit the free exportation of men and machinery. Once commenced, the New Englanders went forward of themselves, and now they produce the best machinery of the world

—*the result of protection against the endless changes of British policy*—and with that machinery they supply the people of South Carolina and Georgia. Abolish protection and establish perfect free trade—and if the doctrine of protection be not true, trade should be *absolutely* free—and the result will be to close every factory of New England, including those which furnish the machinery of which South Carolina now boasts. The men who now work in the machine shops and factories would then grow food, of which the surplus would increase, and the planter would then be forced to abandon food and return again to cotton, and as he would be unable to buy machinery, he would be deprived of every employment but the raising of that one staple, and his power to accumulate capital for the purchase of machinery, even if it could be had, would be effectually destroyed.

Of all the deceptions practised in this deceptive world, we know of none exceeding that which is found in the idea of a revenue tariff with incidental protection. The planter glorifies himself for his free-trade doctrines while abandoning the cultivation of cotton, because unprofitable, for the cultivation of sugar, that depends upon protection for its existence. He insists that protection diminishes the value of his property, when it is well known that its present value is maintained exclusively by the demand for the production of sugar, a protected article. He denies the value of a home market for his products, when the abolition of protection would annihilate the cultivation of sugar that is used in the home market alone, and compel the labour now employed in that direction, to be turned to cotton, to his own utter ruin. He points to Graniteville, and desires that we should see in it the results of free trade, while enjoying a protection of thirty per cent.

The Canadian, ruined by free trade with England, asks of the farmer of Illinois to permit him to send his wheat to New York, that he may enjoy the advantage resulting from protection, but the Illinoisian refuses to permit him to share with him the domestic market, while all the time shouting free trade. Now, why should the Illinoisian object to the admission of Canadian products? He is assured by *The Union* that our surplus of food is so great that all the artisans of England could not consume it, and that but for the great foreign demand it would rot on our hands, and must, of course, know that the price here, if this statement is correct, must be always below that to be obtained in "the great grain market of the world." The Canadian can send his food to England as cheaply by the St. Lawrence as by the New York canals, and even if he could not, he would never permit it to stop in New York when it could go to "the great market," and there command a higher price, and yet the Illinoisian will not consent to a reciprocal free trade. Nevertheless, he *would* consent to annexation, by which perfect freedom of trade would be established. Now, why is this?

The reason is simple, although it may not enter directly into the calculation of those who oppose the Canadian project. Common sense (not that of the correspondent of *The Union*, but *real* common sense) teaches men the advantage of having consumers by the side of producers. The Canadians are all producers. They have no consumers, nor can they have while they have free trade with England, and they desire to seek among us that which they need. They see that the real support of the farmer—his customers for nearly all his immense products—are our own consumers and not those of Britain, and they wish a share of this great market, *while buying abroad the cloth and iron made with Polish food and Hindoo cotton.* The Illinoisian sees that while they would *sell* much here, they would *buy* little, and that the proceeds of their sales would go to the support of men who raised food abroad. With annexation, this state of things would not arise, because the protective system—so far as the existing one is protective

—would be established in Canada as well as here, and the consequence would be that she would expend here, in the purchase of articles produced by aid of Western food, a large portion of the proceeds of the Canadian food sold here.

We take the following from one of the papers of the day, quoted from the *Toronto Patriot:*

"Our tarnation fix is more apparent here: for instance, wheat sells here for 3/6 a bushel—across the river, 5/3; while our people have to pay 25 per cent. more for groceries, the necessaries of life, than on the other side."

The Canadian has free trade, but he desires to relinquish it. He may now send his wheat to "the great grain market" at a duty of a shilling a quarter, or 2⅔ cents per bushel, yet he seeks to be annexed to a country whose surplus is, *as we are told*, so great that all the consumers of England could make no market for it! We earnestly recommend this fact to the consideration of our friendly correspondent.

Annexation would thus be attended with advantage to both. The establishment of reciprocal intercourse, under existing circumstances, would be suicidal on the part of the farmers and planters of the Union, and yet if the doctrine of the last Report of the late Secretary be true, it is a measure to which no possible objection could be made. Nevertheless, the men who regard that document as "unanswered and unanswerable," and *profess* to believe in free trade, are opposed to it. It is time that the farmers and planters of the Union should understand that protection is their measure, intended for their benefit, and that they should abandon the idea of incidental protection, afforded by means of revenue tariffs having for their sole object that of enabling the people who manage the government to obtain the largest amount of taxes to be employed in the maintenance of fleets and armies, and in paying thousands of officers, whose services could be dispensed with, with infinite advantage to the nation.

In his last Report, the late Secretary informs us that:—

"As the high duties under the act of 1842 were rapidly substituting the domestic articles and excluding the foreign rival, the revenue must have declined. If, however," he continued, "the act of 1842 had yielded the average revenue received during the period of its actual operation, this we have seen would have been an annual loss of upwards of seven millions of dollars as compared with the average revenue of the tariff of 1846. With such a result, instead of a large surplus on the 30th of June, 1850, there would have been an addition of more than twenty-five millions of dollars to our national debt, which must have gone on rapidly increasing, requiring in time of peace new and larger loans to be negotiated."

The act of 1842 was rapidly substituting cloth and iron made with home-grown food and cotton, for cloth and iron made with Polish food and Hindoo cotton, yet the revenue did not decline; for the power of consuming foreign commodities increased with every day of its existence, *while we paid off much of our foreign debt*—whereas the revenue is now maintained solely because *we are contracting a vast foreign debt*, the interest of which will have to be paid until the day of repudiation shall come round again. With every year in the progress of the compromise bill, the debt of the nation grew larger, until it grew so large that the power to borrow disappeared, because we could no longer pay even the interest. With each and every year of the tariff of 1842, the debt of the nation grew smaller, because we absorbed the *free trade debt*. With each year of the tariff of 1846, the debt of the nation grows, and when it shall cease to grow—that is, when we shall have exhausted our credit—the revenue will fail, and then we shall have to diminish our expenditures, or again hawk the government loans throughout Europe in quest of purchasers. We beg the reader to compare

our facts with the assertions of the Secretary, and determine for himself on which side lies the truth.

We have just now met with a comparative view of the imports into New York in the first seven months of the three past years, by which the reader will be enabled to see for himself that our power of consuming foreign merchandise, *paid for with our products*, is diminishing, and rapidly diminishing :—

January, February, March, April, May, June, July.

1847	$57,378,368
1848 . . .	53,352,887
1849	55,279,873
Duties collected . .	12,338,346
Same time in 1848 . .	11,917,390

In the present year we have contracted a debt abroad amounting to *many millions*, yet the import into the chief city of the Union *is less by two millions of dollars* than in seven out of the first eight months that followed the repeal of the tariff of **1842.** But for the exportation of evidences of debt, as in the years that preceded repudiation, the revenue would now be deficient many millions of dollars, and so will it be when the demand for capital in Europe shall cause the re-export of those evidences to our shores, to be paid for in specie that must then flow out, with what effect may be known to those who assisted at the last years of the compromise.

We advocate the cause of the farmers and planters of the Union against the demagogues whom they so often permit to govern them, and we should hail with pleasure any diminution of the revenue resulting from the substitution of domestic for foreign articles, but such is the wonderful growth of the power of consumption, when men and women and children are everywhere employed, the consumer taking his place by the side of the producer, that we fear we should look in vain to a diminution of revenue from the establishment of a system of thorough and complete protection. The more coarse goods are made at home, the more fine we can consume. The more we manufactured our own cottons and woollens, and iron, the more silks and laces, and tea and coffee, we could buy, and therefore it was that the revenue grew in amount with every day of the existence of the tariff of 1842, after having diminished almost to nothing with the last stage of the Compromise act.

By a large portion of the agricultural interest, the necessity of protection to their interests, as a means of making a market on the land for the products of the land, is fully understood; and it is time that they understood the power they possess, so fully as to enable them to put the matter on its proper footing. Protection—absolute and complete, and for the sake of protection—is either right or wrong. Free trade—absolute and complete—is either right or wrong. There is no medium. Incidental protection is a fraud, and should be repudiated. Let, then, those who believe that their interests require that the owners of looms and anvils should be required to come and take their places by the side of their ploughs and their harrows, insist upon the adoption of one course or the other, rejecting absolutely all protection except for the sake of protection, and the question will be speedily decided. There is not a professed free-trade man in the Union that if called upon to decide between the one or the other—as all should be required to do—that would not be found clinging to protection. With a Congress containing a majority professedly opposed to the principles of protection, it would, however, be difficult to have the question tried; because with all the violence of profession, there is not, as we believe, a single man that would venture to advocate entire free trade, and not one that would desire to be compelled to

make one of a majority that would adopt it, because perfectly certain that it would be political death to his party and himself. It is, however, entirely in the power of the people who are interested in the question to bring on a decision, by action out of Congress.

It is well known that the manufacture of cotton and woollen goods, and of iron, and the production of coal, have been ruinous to nearly all engaged in them for the last year, and that they are likely to continue so to be. It is equally well known that they are so, and are likely to be so, because of the action of that portion of the people who are engaged in the production of food, and cotton and wool, and in the consumption of cloth, and coal and iron.

It is also well known that the price of cotton, of wool, and of food, is now maintained altogether by the demand for the supply of the domestic market, and that if that demand were withdrawn, because of the closing of the mills and furnaces and mines of the Union, there would be an enormous fall in the price of raw materials, and a large advance in the price of all the articles required for consumption. Now, were the persons throughout the Union engaged in the work of converting the food and wool and fuel into cloth and iron, to come to a determination simultaneously to close their works, and to continue them closed until this question should be definitively arranged, a settlement would take place, and one that would never be disturbed until the expiration of the brief time that would then elapse before the consumer of food, ceasing to require protection, would be ready to unite in the abolition of all interference with the natural application of labour and capital.

The home consumption of cotton now exceeds 50,000 bales per month. Let that demand be stopped, and the price of cotton would fall at least one-half, while the price of cloth would be so far increased throughout the world, that the consumption would be diminished by one-third—and then the producer of cotton would be the first to solicit the consumer of food and of cotton to resume his operations.

The supply of coal to markets on the seaboard, is now 3,000,000 of tons, and the consumer of fuel obtains twice the comfort, at half the cost, while the farmer has his produce transported to market in half the time at one-third of the cost. To bring about these results has required an investment of $60,000,000, and those who made the investment have been ruined. Let the producers of coal stop their works, and coal would be $20 per ton, for the deficiency could not be supplied from abroad.

The producers of iron now furnish 800,000 tons. Were the furnaces blown out, *the whole exports of the Union would not pay for that quantity imported from abroad*—leaving out of view the cloth and fuel that would be required. Let the furnaces and rolling-mills be stopped, and the price of iron would at once be trebled.

The food required for the supply of those who are, directly or indirectly, employed in the production of fuel, of cloth, and of iron, amounts to more than $100,000,000, and it is that demand which now fixes the price. Were it diminished even one-half, freights would rise to five shillings per barrel, while the price of flour would fall to two dollars and a half; for the direct effect would be a reduction in the price abroad, and thus the ship-owner and the manufacturer of England would be enriched, at the cost of those farmers and planters.

It is constantly assumed that the persons engaged in converting food and other raw materials into cloth and iron, are a set of mendicants, dependent on the charity of the producers of raw materials for support, whereas the fact is directly the reverse. The party most interested in the establishment of efficient and permanent protection is the owner of the land and the driver

of the plough, and it is on his part that the dependence exists. He cannot stop his machine. He *must* raise food or cotton. The men who raise coal and ore, and the men who make machinery, can do something else. They can go to work to raise food for themselves, ceasing to be consumers and becoming rivals. The power is in their hands, and were they once to determine to exercise it, the question would be settled at once and for ever. Let the plough and the harrow feel, even for a single month, the effect of the total withdrawal of the loom and the anvil, and their owners will never desire a repetition of the experiment. We should regret to see the necessity for such an experiment, but if by its aid the farmers and planters of the Union could be brought to a proper estimate of the advantages that must result to them from making a market on the land for all the products of the land—exporting cotton cloth instead of cotton, and importing the comforts and luxuries of life instead of the necessaries—it would do more to promote the happiness and comforts of the whole people—more to promote the improvement of agriculture—and more to promote the progress of physical, moral, intellectual, and political improvement, than any measure ever adopted in the world, from the creation to the present hour.

And why should not such a measure be adopted? There is to be settled a point of great importance to the welfare of the whole nation. The producers of food and cotton, and consumers of cloth and iron and fuel, insist that the consumers of food and producers of cloth and iron and fuel, are but a race of sturdy beggars, dependent on their bounty. This the latter deny, and assert that to their presence is due the prosperity of the former, and to prove the fact they say, we withdraw our services, and when you need us send for us. We are willing to convert your raw materials for you, or we will ourselves produce raw materials in competition with you. Determine for yourselves what shall be our mode of employment, and we will rest content. Could any objection be made to such a course of action? Can there be any doubt what would be the result? We think not. The fact that the real protection is on the part of the farmer and planter, would thus be settled for the country and for the world, and the whole world would then unite in the measures requisite for the destruction of the colonial system, which has, according to Lord Brougham, and other distinguished British authorities, the *smuggler* for its natural ally, and which has destroyed the comfort and happiness of the people of Ireland and India, of Canada and the West Indies, and of every other country subject to it. Trade might then become absolutely free, and custom-houses might then be closed, for the disturbing causes, now necessitating protection, would then be removed. Let our South Carolina friends, then, unite in the measures requisite for bringing about absolute freedom of trade, by repudiating incidental protection, adopting the policy of *protection for the sake of protection.*

Saw-dust as a Manure.—Henry H. Drummond, Esq., M. P., in a communication to the Highland Society, says, "I have for a number of years been in the practice of using saw-dust in agriculture. I keep it in composts for about three years, which time has appeared to me necessary for its proper decomposition. This process is greatly facilitated by mixing the saw-dust with lime in the proportion of about one-tenth part of lime, and the compost is much improved by the addition of road-scrapings, or earth of any sort that can be procured. The saw-dust heap is a convenient place of deposit for dead animals, which are thus disposed of to great advantage. A compost of this kind, which has been well mixed and decomposed, and turned over by the spade at proper times, will produce an excellent crop of turnips."

THE VETCH, OR TARE.

LET IT BE FULLY AND FAIRLY TESTED.

We have repeatedly remarked upon the difficulty of getting things imported for exhibition and trial, in the United States, such as experience has recommended to high favour in Europe and other countries. The annals of European agriculture make frequent mention of plants and machinery, with every promise of usefulness if imported, yet nobody—either individual or society—has the enterprise to send for and try them. This has not been entirely the case with the vetch, or tare, which enters extensively into the modern husbandry of England. It has been partially tried in our country, but who can say whether fully and fairly, and with what success?—and though it may have failed in one locality, does it follow that it should do so in all? On the contrary, there is good reason to believe that it would answer an admirable purpose, especially as calculated to supply much-needed links in a complete series of grasses or plants adapted to *soiling*, work-horses, and milch-cows, particularly near large cities.

There are several varieties of this plant, but the two chiefly relied on in England are the *winter* and the *spring* tare. The winter tares are best sowed with rye, the spring with oats. They are liable to change, like wheat—the winter into spring tares, if repeatedly sowed in spring—so spring wheat may be made of winter wheat. Tares or vetches, when used as green forage, are cut after the pods are formed, but long before the seeds are ripe. They are said to be exceedingly nutritious, and to supply a larger quantity of food for a limited period than almost any other forage crop, and, when cut early, will yield a second crop. All animals are fond of them, and thrive on them remarkably well; and it is said that cows give more butter when fed with tares than from any other food whatever. Horses, too, are said to thrive upon them better than upon clover, and the same is said as to fattening cattle, which fatten faster upon this article of green food than upon any other kind of grass or esculent in use in England. Hogs, too, it is asserted, may be fattened on tares alone; and if they make as good bacon as another of the leguminous family—the *North Carolina pea*—why then all we have to say is, that no one ever did or need to taste better.

In Ireland, the tare is cultivated to come in between the cuttings of clover, but in England it is often the principal resource for soiling, from May to November, being sometimes ready for the scythe before the clover. They sow it at different times through the spring—the first sowing coming in after the first crop of clover is all consumed or made into hay, and the successive spring sowing yields a supply of green food throughout the summer and autumn.

It is supposed that in all our large cities any thing of this kind might be ordered through regular and respectable seedsmen. Perhaps the Patent-office will import a small quantity of it and of other seeds of equal promise, and then issue, through members of Congress, brief directions for cultivation?

When intended to be cut green, for soiling, they are always sowed broadcast, at the rate of from 2½ to 4 bushels to the acre. The crop is most profitable when cut as green food, in which case they should be sowed at different times, from the middle of March to the first of June; and when it is intended to save the seed for a subsequent sowing, the better way is to drill as much land as may be necessary for that purpose.

INFORMATION WANTED ON VARIOUS SUBJECTS.

Not being prepared to answer, at the moment, several of the queries submitted in the following extract of a letter from a planter of high respectability in South Carolina, we deem it best in the mean time, and as auxiliary to the purposes of the writer, to throw it before our readers, and to solicit information. We are sorry to find in it evidence so conclusive of the unprofitableness of cotton culture generally in South Carolina. If the chivalrous and generous-hearted people of the Palmetto State, when they embarked largely in the culture of cotton, after the invention of Whitney's cotton-gin, had adopted and adhered to the policy of forcing the loom to come to the cotton, just as the mill is brought to the grain, instead of sending their thousands of bales thousands of miles to look for the looms, their richest lands would have been brought into play, their old lands recruited, their husbandry would have been diversified, their population increased, internal resources developed, railroads would have ramified the State, and have borne, before now, the riches of her mountains to the sea-board; but she chose to carry all her eggs in one basket, and to send that to distant markets, and here we see the result:—

Columbia, S. C., July 28, 1849.

J. S. Skinner, Esq.—*Dear Sir:*—Being a subscriber to your periodical, "The Plough, the Loom, and the Anvil," and knowing the interest you take in agricultural matters in general, I take the liberty of writing to you to gain some information as to the usefulness of the reaping machine, sometimes used for cutting wheat, and whether it answers the purpose? How much it cuts in the day?—and what is the price? My lands are free from stumps and stones, and perfectly level. From what I have heard of them, I think they will save me a vast deal of labour. *I find that planting cotton in this State is no longer profitable; for after paying for bagging, rope, twine, freights, drayage, storage, insurance, and commission, the cotton selling for seven cents per lb., the bale amounts to* $24·50; *deduct the expenses from the amount, leaves* $20·50, *or nearly one dollar in every six—you see, a ruinous business. I have determined to give it up, and see if by planting grain I cannot do better.* I must, therefore, ask your advice as to the best wheat for a Southern sun, and what time to sow it. I have made inquiries of my neighbours who plant wheat for their own use, what quantity they make to the acre, and find their average to be about twelve bushels per acre; and they give me to understand that the rust is the only drawback that cannot be entirely avoided, and that partially, by planting so that the grain may mature in *May*. The smut, in olden time, injured the crops too, but by the use of blue-stone that is overcome. We have as yet no fly to contend with, but occasionally the chinch-bug. So I hope to see this part of our State, certainly on the river low grounds, a grain-planting country.

What two-horse plough is most thought of with you for breaking up land—and what is the price?

Will you be kind enough to let me know the number of glass factories at the North—where they get their potash, and how much they use, and what they pay for it?—for I think potashes can be made here to advantage. Also the value of pearlashes, salæratus, and soda?

Yours, most respectfully, J. V. S.

☞ Perhaps venders and inventors will, after a while, find out the advantage of availing themselves of our advertising sheet—provided for *their* convenience.—*Ed. P. L. & A.*

THE ENGLISH COLONIAL SYSTEM.

It was the opinion of General Jackson, as expressed to Dr. Coleman, that we were too subservient, in our legislation, to the "policy of the British merchants." To enforce her colonial system on the world, and to compel the world to send her the raw materials to be manufactured, and the food to be eaten while they are being manufactured, (instead of leaving the world to consume its own food by its own manufacturers,) Great Britain maintains in commission, says the very discreet and well-informed correspondent of "The National Intelligencer," ships and armies as follows:

45	of from 1 to 10 guns	total guns 336
34	10 to 20 "	" 459
3	20 to 30 "	" 70
3	30 to 40 "	" 116
9	40 to 50 "	" 404
1	50 to 60 "	" 56
8	70 to 80 "	" 590
4	80 to 90 "	" 336
1	vessel mounting	" 92
1	ship "	" 101
1	" "	" 104
1	" "	" 110
2	ships of 120 guns each	" 240
113		3014

20 tenders, schooners, brigs, &c.
5 vessels on Arctic expedition, &c.
2 Royal yachts.
8 Dover and Falmouth packets.
30 steamers, guns enumerated 151.
32 " guns not enumerated.

The British army consists of:—

2 regiments of life guards.
1 " royal horse guards.
7 " dragoon guards.
17 " cavalry, various lancers, hussars, &c.
3 " grenadiers, Coldstream, and fusilliers.
99 " foot infantry.
1 " rifle brigade.
9 colonial regiments.

139

East India Company's service:—

	Cavalry.	Irregular cavalry.	Infantry.
Bengal	11	18	74
Madras	8		52
Bombay	3		29
	22	18	155

"It will be seen that the maintenance of the Company's power in Hindostan requires nearly two hundred regiments of their own troops, and at the present moment twenty-four regiments of the British army are also stationed there. The country must be valuable, in some sense or other, which requires such an immense force to keep it in subjection. It certainly is not so with the Company, in point of direct revenue; for, according to printed statements, there have not been more than three years out of the last twenty in which the expenditure has not exceeded the income.

"We scarcely know whether we could not run out the parallel in respect to almost all our colonies. It is certain that at present they afford employment to, or at least require the presence of, thirty-nine regiments of the British army."

Now the common notion is that we should keep up armies and navies, lest, some day or other, we may be brought into contact with England, and hence it is that the farmers and planters (in large proportion) have paid some five or six hundred millions of dollars since the last war with England, for our military establishments. The dictates of good sense and humanity would be to expend these hundreds of millions for the construction of the means of intercommunication, and more especially for the establishment, in each State, of schools wherein the course of instruction should be as exactly adapted to the use of the plough and the harrow—to civil engineering—draining—chemical and geological knowledge—animal and vegetable physiology—as exactly as that at West Point as to the use of the implements of blood and slaughter—and the day is coming, slowly, but still it is coming, when the *people will have it so.*

BRING THE CONSUMER NEAR THE PRODUCER.

"THE expenditure of ten millions of dollars in placing the consumer of food by the producer of cotton and food, would double the power of the South."—*Carey's "Past, Present, and Future."*

Ten millions of dollars invested in cotton mills on the Lower Ohio, where coal and food are cheap, would result in the immediate increase of the home cotton market of at least eighty millions of pounds, or 200,000 bales, and would make a new home market for food of at least half a million of dollars a year.

This would be but the beginning of the process of home concentration of capital and population for manufacturing purposes. In a few years, the ten millions, thus employed, would be doubled and probably quadrupled. It would be here, as it has been in England, in Belgium, and in New England; the manufacturers, here as there, would accumulate with rapidity, and lands and the product of lands would, here as there, rapidly appreciate.

Let the farmers remember that, when the market is far away, they or their factors must send the surplus produce to the market, and that, when the market is near, the consumer or his factor will come to their doors to purchase.

Good land near Lowell is worth two to five hundred dollars the acre; near Manchester the price is still greater; and its average value in the manufacturing section of Belgium is about three hundred dollars an acre.

The Middlesex farmer sells his beef at from twelve to sixteen cents a pound, and his potatoes at eighty or ninety cents a bushel. Shall our farmers be content to send their beeves to the Brighton market and pay out two-thirds of the proceeds of their sales in the expense of driving their beeves to Brighton?

The wife of the Middlesex farmer can exchange a pair of chickens, and at her own door, for eight yards of sheetings, while the wife of the Wabash farmer has to take her chickens to the nearest town and gets for them only two yards of sheetings.

The Lowell manufacturer makes large profits, and pays high wages, and in cash down at the close of every week or month; the men and women who get high wages can afford to pay high prices for what they eat; while the farmers who get high prices for what they have to sell can afford to pay high prices for land, or the use of land, and still spare enough to send their children to the best schools, and then aid them in commencing the business of life.

If we would keep up the wages of labour; if we would make good roads; if we would have good schools; in short, if we would surround ourselves with all the conveniences and comforts of life, we *must* bring the consumer to the side of the producer.

SHEEP.—HOW THE BUYER IS TO KNOW IF THEY ARE HEALTHY.

Sheep are so liable to various diseases, that much care is necessary on the part of the purchaser, especially when they are intended for breeding stock. As to the signs of unsoundness in sheep in the butchers' shambles, it would be almost needless to give any directions, for few purchase their own meat, and those who do, would not take the pains to learn how to judge. In towns, the market-money is usually given to servants, who take what good judges would reject.

In marketing, we have all our lives observed one rule—that is, to leave nothing of *its kind* behind better than that which we bring away. To be sure, an article may be of a price too long for the length of your purse, in which case it is easy to let it alone; but rather get never so little of that which is the best of its kind, than buy that which is inferior *because it is cheap*.

As to mutton particularly, we are apt to be captivated by its grossness, rather than its juiciness and tenderness—hence a Dishly, all fat and no flavour, will sell more readily than a well-flavoured, juicy Southdown. But our present business is with the signs of health in sheep intended for breeding-stock. The appearances of soundness and vigour of constitution are, a lively briskness of temper: a brilliant clearness of the eye: a florid, ruddy colour on the inside of the eyelids, nostrils, and gums: fastness in the teeth: a sweet, fragrant breath: dryness of the nose and eyes: the breathing easy and regular: coolness in the feet: dung properly formed: fleece firmly attached to the skin, and unbroken: and the skin exhibiting a florid, red appearance.

Now, reader, will this go in at one ear and out at the other, or will you examine your own sheep, and be guided by these directions in purchasing. Are our signs true?—if not, wherein are they not?

The preference for fat meat in England is not to be wondered at, because there generally the hard-labouring husband eats the flesh, while all that is left for wife and children is the gravy yielded by the fat, to season their bread and vegetables. Hence it is that there nothing but fat meat will sell in the market.

Food of Plants.—Humus, which contains ulmic acid, and possesses many of its most important properties, is the true food of plants as obtained from soil, and there are many facts which lead to the conclusion, that it reaches the plant in combination with ammonia. Now we have every reason to believe that it is from this ammonia that plants derive their nitrogen; and that they will receive sufficient in this way is proved by the fact that in no plant does the nitrogen amount to one-twelfth of the carbon, which is the proportion in which they exist in ulmate of ammonia. Ulmate of ammonia is a constant *result of putrefaction* both in the animal and vegetable kingdom.

SOME STATISTICS OF OHIO.

We have the pleasure to acknowledge the receipt, as well from Mr. Bateman, the Secretary, as from Governor Trimble, the President of the Ohio State Agricultural Society, of a copy of the "*Third Annual Report of the Board of Agriculture*" of that strapping member of our great sisterhood of free Republics. But who can wonder at the growth of the young giantess, when we consider the extent of her range, the quality of her soil, and the fat things, besides buck-eyes, she has to ride and feed upon, as here exhibited in this report:—

		Value.	Average value per capita, about
Horses over two years	492,509	$16,856,841	$34·25
Mules over one year	2,098	78,955	37·67
Cattle over two years	983,822	9,729,929	9·88
Sheep over six months	3,577,171	1,988,316	0·54
Hogs " "	1,879,689	1,879,689	1
Total of domestic animals over a certain age	6,835,289	30,533,230	

So, with a population in **1840**, of **1,519,467**, every man, woman, and child within her borders may be set down as a "*whole hog man*," with something to spare; nearly one bullock apiece, and more than two sheep; and then, for riding, if they are not too proud to ride double, every soul of them may go on the back of a horse or a mule to meeting on Sunday. What a glorious country! No wonder Father Mathew wishes he could pick up all Ireland, as you would a potato, and put them down in the United States What a transition it would be! From the refuse potatoes, and starving for want of them, to more hog and hominy, and apples and pumpkins, than any man knows what to do with! How can any nation become civilized whose mind and labours are tied down to a simple root, involving no mystery—requiring no art for its production or cookery? Poor creatures, whose utmost hopes and ambition are limited to as many roots as will keep soul and body together! Do not people in such a condition cease to become free and moral agents, subject to the moral responsibilities that attach to freedom and abundance? Assuredly we have much to account for as a nation, if "to whom much is given, of him will much be required."

Above all things, should prosperous nations be held accountable as such, to God, for any wanton breach of the peace of the world, thus plunging into that foul current, which, as it rises in, so it tends to profligacy, cruelty, and barbarism. But what have farmers to do with the social condition of things, and the causes and consequences of war? Does any thing concern them except how to make a peck more of corn or a pound more of cheese? —and besides, is it not clear that the more wretched the labourers of Europe, the cheaper is their labour to aristocratic capitalists, and the products of their labour to us? Are we to be taxed, says the "free trade" man, to ensure to American operatives higher wages than their labour would command abroad? No, certainly not. Let us buy our cloth and our iron of Mother England, where men labour for not quite enough to keep from starving—then we may be sure of starving the man at the loom and the anvil in our own country; and what then? Why then we shall be left in unqualified dependence on their products abroad, and those at home who would gladly labour at the loom and the anvil, and eat on the seaboard the cattle and the corn of Ohio, will be driven to Ohio to raise corn and cattle for themselves—and then what will Mr. Laughter say, who, according to friend Bateman, makes 140½ *bushels of corn to the acre, on eleven acres?* Why, we guess

he will laugh on the other side of his mouth, as will not all those, if they succeed, who are for separating the loom and the anvil from the plough and the harrow—looking to and depending on the *foreign instead of the home market?* And thus it is seen at last, that the planter and the farmer have something to do with the question of protection and free trade—and that from Irish potatoes may be extracted something of political and moral philosophy, as well as Irish whisky.

A GREAT BREED OF SHEEP.

"At his sheep-shearing, a few days ago," says the Winchester Virginian, "Col. Josiah W. Ware, near Berryville, Clarke county, Virginia, took from one of his Cotswolds the enormous quantity of eighteen and three-fourths pounds of wool. Some of the staple we are told measured sixteen inches in length."—*Pennsylvania Inquirer, June* 8, 1849.

We do not know, but we presume the above was the growth of more than one year—probably of a yearling last spring. Col. Ware, like Major Reybold, and others, has for years been doing much to improve the breed of sheep, for wool and mutton.

At the Cattle Show at Baltimore, last autumn, Col. Ware added much to the exhibition in this department of domestic animals. The home-bred ewes shown by him on that occasion, were all thorough-bred Cotswolds, and had not been fed on grain or any thing else, except what grass they could gather in a very poor pasture, until within a few days of leaving home. The home-bred ram was a yearling, (perhaps the one sheared as above,) was with the ewes, received the same treatment, and had been with 80 ewes. Before they left home, the lightest ewe weighed more than 200 lbs. His wethers had not been fed except a few days before leaving home, and were on the same pasture—notwithstanding which, the lightest weighed more than 210 lbs., and they were sent home to be fattened, though high offers were made for them.

Of his imported sheep, all three were got by the ram that took the *high prize* at the great fair at Northampton, held by the Royal Agricultural Society, and were out of *prize ewes*, and the two ewes were part of the pen which last year took the highest prize at the Royal Agricultural Fair at York, in England: they were just landed, had been more than fifty days at sea, and confined more than sixty days. They were all yearlings, their purchase was not limited, and their cost was high.

Will such expense and public spirit meet with their just reward in our country? That is the question. We sincerely hope all such patriotic enterprises may.

A Profitable Sheep.—Seymour Aldrich, a farmer of the town of Hopewell, in this county, on the 8th inst., sheared twelve pounds of clean, fine wool, from a Paular Merino Buck. The wool had a growth of less than one year, the sheep having been sheared the 26th day of June last. Who can beat that?—*Canandaigua Repository.*

Railroad Iron.—The *Chambersburg Whig* states the cost of the rails about to be laid on the Cumberland Valley road will be $250,000, for which a preferred lien is to be given on the earnings of the road. They are brought from abroad.

Who says we are not more useful to England than if we were *avowedly* an English colony?

ON THE FOOD OF PLANTS.

BY DR. BALDWIN.

The analogy existing between animal and vegetable life, is too striking to have escaped the observation of any one who has paid the slightest attention to the subject. It is, indeed, truly wonderful to observe how manifest it is throughout, from the highest to the lowest orders of the animal and vegetable kingdoms. Heat, light, air, and water, appear to be equally indispensable to the existence of both, in quantities differing very materially, according to the natural constitutions of each individual species, but manifestly essential to all, for neither plants nor animals can exist for any length of time if totally deprived of any one of them. Food is indispensable to vegetable as well as to animal life; in this respect, also, the analogy is very apparent, some species of each requiring an abundant supply of the richest food, and others consuming so small a quantity as almost to induce the belief that they exist without it. Yet for all those plants and animals which interest the agriculturist, it is very obvious that food is absolutely essential. A beneficent Providence has made an abundant natural provision in milk, for man, and the young of those animals which appear to be more especially destined for his comfort and support, and it is not reasonable to believe that He has neglected to make a suitable provision for the vegetable creation upon which animal life so essentially depends. It has occurred to me that a careful observation of the facts connected with, and essential to the growth of all plants, would tend more to elucidate the mystery of their aliment than the many theoretical speculations which this subject has already elicited. The experience of every practical farmer teaches him that he cannot expect to mature a crop of any kind in an exhausted soil, but if he manure it, that is, if he place in it a sufficient quantity of any substance, animal, vegetable, or mineral, which has been previously subjected to the putrefactive fermentation, he has it then prepared to yield him a crop, not of one kind only, but of any and every kind which he may desire to cultivate. By successive crops of any one kind he may again exhaust it, and this he can effect much sooner by some crops than by others. He is not ignorant of the fact that some plants appear to have a peculiar affinity for some of the neutral salts, which promote their growth in a remarkable manner, yet he knows that these salts are not the *aliment* of those plants, for they will not cause them to exist in an exhausted soil. And he has yet to learn that any substance whatsoever, animal, vegetable, or mineral, will enable him to raise a crop of any kind in an impoverished soil, except those substances which have been previously subjected to putrefaction, or which are capable of speedily undergoing that process. These familiar facts appear to me to demonstrate clearly that there is but one aliment for all plants, to wit, the residue of putrefaction, which is consumed by them in different quantities, according to the natural appetites of each particular species, but indispensable to every one, for if deprived of it they inevitably perish, however plentifully supplied they may be with every other essential. The labours of those learned chemists, who have recently directed their attention to agriculture appear to me to be as futile as those of their predecessors in former ages in search of the philosopher's stone, by which they expected to transmute the baser metals into gold. If the analyses of the bodies of young animals would satisfactorily demonstrate that they had existed solely upon milk, what practical advantage would result? Can the chemist teach the farmer to make milk?—or teach him the process by which he may be ena-

bled to separate any one of its constituents, which would prove to be a cheaper or a better nutriment than that so bountifully supplied by nature? And this appears to me to be precisely the case with respect to the food of plants: no chemist will ever be able by analysis to separate the fertilizing principle from it, or make it in any other manner than that ordained by Providence, namely, by the putrefactive process. That the earth itself is capable of being converted into the food of plants is a proposition so plainly proved by facts, so constantly before the observation of every practical farmer, that I cannot help being surprised that any one should entertain a doubt upon the subject. Under *any and every substance* which has covered its surface for some time, the earth is always found to have acquired great fertility. Many ingenious theories emanating from learned and scientific men, in almost every age and country, have been suggested to account for the fertility of the earth, and to demonstrate the precise nature of the food of plants. The only one, however, which appears to have received the approbation of agriculturists of the present day, is that which attributes all the fertility found in the earth to the decay of vegetable matters upon it or in it, and defines the pabulum of plants to be a peculiar fertilizing principle termed humus, always contained in the product of that decomposition. That this theory is entirely erroneous, I believe, for reasons which I shall now assign:—1st. Vegetable substances decomposing upon the surface of the earth are unfavourably located for the generation of the putrefactive process, by being exposed to all those causes most inimical to it, to wit, heat, light, and a free circulation of air. 2d. The residue of eremacausis or slow combustion, (that kind of decomposition which all substances appear to undergo when unfavourably located for putrefaction,) *is not manure*—"woody fibre in a state of decay" always proving pernicious to vegetation of almost every kind. 3d. The trifling quantity of the residue, even if it were the best of all manures, would not account for the great fertility imparted to the earth by the decomposition of vegetable matters upon it, as is exemplified under the leaves in the forests, and under clover or straw. 4th. There is no greater degree of fertility imparted by substances which are decomposed than is always produced by substances incapable of decomposition. Vegetable substances, when ploughed under and permitted to decompose, will undergo the putrefactive process, provided they have previously been saturated with water, or by the addition of alkalies, or hot manure, for reasons which require but a slight knowledge of chemistry to understand. That they do not undergo that process under ordinary circumstances, is plainly manifest.

1st. Because vegetable matters, when ploughed under, are unfavourably located for putrefaction, by being deprived of a contact with air which is admitted to be essential to that process. 2d. It contradicts the experience of every practical farmer, that the cleaner a field is of all vegetation when fallowed, the more certain it is to produce a good crop. 3d. No fertility can be imparted to the soil, by ploughing under green crops of any kind, or by leaves, straw, clover-hay, or weeds, if they be spread immediately before ploughing. 4th. The fertility which is always imparted to the earth by a luxuriant growth of clover, is not in the slightest degree diminished by the removal of the whole crop previous to fallowing. I have been induced to ascribe the fertility of the soil to shade and shade only, for reasons which follow. 1st. That shade is indispensable to the generation of the putrefactive process in all substances. 2d. That the surface of the earth when densely shaded, is located precisely in that situation most favourable to the generation of the putrefactive process, namely, in a close, cool, dark, damp location, with a slight contact of air. 3d. The appearance of the earth in-

dicates that it has undergone a chemical change, for it is changed in colour, consistence, and fertilizing qualities. 4th. The natural renovation of worn-out lands, and the great fertility of forest lands, cannot be accounted for by any other principle. 5th. That the fertility imparted to the soil depends solely upon the density and duration of the shade, without regard to the quality of the covering substance. 6th. That large quantities of the richest mould, which is known to be the best food of plants, have been found in locations where vegetation never could have existed. 7th. That the fertility imparted by the growth of some vegetable matters upon the surface of the earth, is not increased by ploughing them under, or diminished by their previous removal. Much importance has been given to ammonia as an aliment of plants by many agriculturists, in consequence, I presume, of the fact that it is always generated and evolved from *all substances* during the putrefactive fermentation, even from the earth itself, according to "Thaer's Principles of Agriculture," page 148: "When kneaded clay is exposed for a considerable period in large masses, and in a damp situation, it assumes all the characters of putrefaction. Ammonia is then formed in it, thus proving the presence of nitrogen, which is a constituent portion of ammonia." I am not apprized of any facts which demonstrate satisfactorily that ammonia, or any one of its salts, carbonate, nitrate, muriate, or phosphate, is the aliment of plants, when separate from those substances which generate them. And from all the observations I have been able to make, I feel confident in the assertion that the fertilizing virtues of manures are not volatile substances. Although shade is indispensable to the production of the putrefactive process, and the more dense the shade the more valuable the manure, yet after that process has been perfected and the manure formed, no exposure to the weather diminishes its fertilizing qualities in the slightest degree. Even after years of exposure, although lessened in bulk very considerably, it will not be found to have been deprived of a single particle of its fertilizing principles. Nor can the earth be exhausted of its fertility by tillage, and exposure to the summer's sun or winter's frosts; nor in any other manner than by the growth of plants which consume it.

BANKS WANTED.

Yes, in Maryland, Virginia, and all the Southern States, nothing stands more in the way of agricultural improvement than the difficulty of raising money on real estate, for the improvement of landed property. Were it not for this, thousands of industrious men, who have been taught by agricultural journals, how sure is the process of improvement, find it yet impossible even to *begin*, for want of as much money as would buy 1000 bushels of lime; although it could be made morally certain that the use of it would, in a certain process of time, enable them to return the loan, and to prepare the land to which the lime was applied, capable of yielding 50 bushels of corn instead of 15, or 25 bushels of wheat instead of 5 bushels to the acre, with the same amount of labour.

The use of money in agriculture answers the same purpose that *steam-power* does in manufactures. It gives efficiency to labour, and life to a *caput mortuum* or dead body—and this is one of the secrets why towns grow large in the Southern States, while the country goes to waste; and villages dwindle away, until they disappear altogether, after lingering through an existence always miserable when in a state of conscious decline.

In New England, where the loom and the anvil are everywhere at work close to the plough, they order things differently. There, every hundred

or district has its little bank, where the small farmer and the small tradesman or mechanic, if known to be industrious, can borrow what is needed to *give him a start.*

A gentleman was lately travelling in Connecticut, and, halting at a place where there was the kernel of a town, to wit, a hotel, a store, and a blacksmith's-shop, he inquired the use of a fourth little edifice, which the landlord informed him was *a bank!* "Ah, yes," said the traveller, "one of those banks, so-called, as I suppose, in which the vault for safe keeping the basis of circulation, is an old flour barrel!"

"There, sir," said the landlord, "you are labouring under a gross mistake. We have, a little way back here from the road, a small water-power, and factory; and this bank, of which the capital is $50,000, is the savings-bank of the operatives, and of the whole neighbourhood around; and from it any industrious farmer or mechanic can borrow $200 or $300, or $400 or $500, or $600, or even $1000, as he may need it, to carry on any promising improvement, or extension of his premises or business. The depositors and stockholders are numerous, but none have a large amount at stake. They are content with a small but certain interest on their investment, as long as they know it is in safe custody—the bank being made to give a lift to deserving people of industrious habits and middling circumstances, instead of supplying fine houses and large salaries to a few officers. It is conducted at a very trifling expense, so that the interest on loans is nearly a net income."

"Ah, sir," said the Southern traveller, "I begin now to see how it is that your country is so thriving—houses and fences all in good order, with well-pruned and fruitful orchards and gardens. Your people have but little land, but then they have consumers *near at hand*, working at the loom and the anvil to demand what they make on the spot where it is made: and banks at hand made up of the earnings of all, to be loaned out to give activity to genius and employment to labour.

"In the South, from which I come, our policy has been to keep the loom and the anvil, the hatter and the shoemaker, and the plough-maker, at a distance from the plough and the harrow, and thus it is that almost every man's capital, who has any capital at all, consists in *land* exclusively, of which many have 500 acres, who cannot for their lives borrow $500, nor $200, to buy lime or guano. They are in the condition that a man would be, who, having but $20,000, should lay it all out in the *hull of a great ship*, leaving himself destitute of money or credit to buy even sails or rigging, let alone the means to lay in a cargo and hire seamen."

Now here, reader, you have an outline of the difference in the condition of the South, which goes dead against, and the North, which goes for "encouragement and protection" of *American industry.* When this great question of questions was first raised—a question which above all people most concerns the farmer and planter—the South went *for*, and the North *against* protection. The North thought it might operate to abridge their commercial enterprise, for which they possessed peculiar genius, habits, and advantages; but when the policy was established by the votes of Southern men, these Northern people had the sagacity to say, "Very well, since it must be so, and has begun to take root, let it not be disturbed, but let us see how we can make the most of it." Even the Agricultural Society of the old Bay-State remonstrated against a tariff for encouragement of American manufactures; but, said she, when the measure was carried against her, "*any system is better than eternal fluctuation.*"

Labour delights and is happy in the *certainty* of its returns, however moderate; and capital, when it perceives the ground to shake under it, and

the times to be portentous of change, turns its back and flies away, as the cautious skater when he feels the ice begin to bend under his weight. Let us have but a fixed policy of "encouragement and protection," and specific duties, and we shall find condensation of population, and combination of forces of all sorts, physical and intellectual. The loom and the anvil will gather near about the plough and the harrow. Improvement will precede expansion of population, of which it will be the only legitimate parent, and the great result will be improved education, the maintenance of peace, and the steady growth of public and private virtue, and all the arts and blessings of the highest civilization.

Every county in Maryland and Virginia should have a bank—a small one—in proportion to its inhabitants—divided into small shares, and among all the people. Let him who cannot take **$100**, take **$50**, or **$25**. Not to be loaned to nabobs, or to furnish big salaries to its officers, but for the accommodation of small, industrious men—to hire labour, and to buy lime and other manures—to build good stables and out-houses, and small factories, to use up the wool and the hides, and the tan-bark, and a thousand things that are wasted.

There are more than **100** banks in Massachusetts, and their notes *everywhere at par*—"as good as gold." Thus it is that no element or source of productive industry—neither genius, industry, or materials—lie idle for want of means to put them in active operation. But you do not hear them eternally crying out "free trade—free trade!"

Let us buy where we can buy cheapest—sell where we can get most—for well they know, that, in the long run, that may often be bad economy. Well they know that a man had better deal with one who will pay him **60** cents a bushel for his corn, one year with another, than to get **$1·00** this year, and **40** cents for ten years to come.

THE CHESAPEAKE AND OHIO CANAL.

HOW CONNECTED WITH THE AGRICULTURE OF VIRGINIA.

A CORRESPONDENT of the *Alexandria Gazette* says:—

"In a recent calculation, based upon the census of 1840, we find there are seventeen counties to be directly benefited, and likely to furnish supplies to the canal, viz.:—Morgan, Hampshire, Hardy, Warren, Shenandoah, Rockingham, Augusta, and Pendleton, in Virginia—with Alleghany, Washington, Frederick, and Montgomery, in Maryland, producing 14,425,134 bushels of grain—being within a fraction of 92 bushels for each inhabitant, and the 42d part of all the grain raised in the United States, in 1840. These counties are to be directly benefited by the completion of this work, and will send down a large proportion of this produce to the cities of the district, and to Alexandria especially. With facts of such magnitude before us, and the immense coal trade awaiting the completion of this work, who can calculate the reflex influence of our city upon the Treasury of the State, when compared with the small sums drawn to place us in a condition to attract this immense trade?"

Speaking further of the great iron works at Mount Savage, he observes:—

"No proper calculation can be made of the power and capacity of the works at Mount Savage. I have been informed that one and a half millions have been expended from time to time, in their construction; but in consequence of the depressing influence of the late policy of the government in not affording sufficient protection to the iron interest, these works have been compelled to suspend: and recently have passed into other hands, at an immense sacrifice. The present company are waiting, I understand, for some modification of the tariff, by which sufficient protection will be afforded them against the pauper labour of European countries."

Yet there are those who would prefer a tariff under which coal and iron are imported from England, for fear—for fear—of what? Why of violating the principles of "free trade," and the—resolutions of '98!

SOME THOUHTS ON TRANSPLANTING TREES.

THERE are few operations in American Husbandry, in which so much want of reflection, not to say gross and wilful neglect, is displayed, as in the *transplantation of trees*—whether for fruit or for ornament. It must, however, be admitted, that in this as in all other branches of rural industry, much improvement has taken place within a quarter of a century, since agriculturists commenced to *read* and to *reason* on the *principles* that are involved and brought into action in the practice of every branch of their business, as well as in the business of ship-building, or navigation, or of manufacturing iron or leather. The former practice was (to what a lamentable extent it still continues!) to dig a hole for a young and tender tree, as for a gate-post, just large enough to jam it down, often times doubling up the roots, throw back the dirt to fill up the hole, ramming it with a small rammer, or the handle of the spade, or the eye of a hoe, and there leave this tender creature, without more care or attention, to take care of itself. Let every reader ask himself whether there is much, if any, exaggeration in this statement of the general management of young orchards within his remembrance! Is it any wonder, therefore, that disappointment and mortification should ensue—any wonder that if the tree lives at all, its growth should be stunned, its existence sickly and unfruitful, and its death premature? Why, does any man believe that it ever was intended that such management, if it be not an abuse of terms to call it management, should be crowned with success? We might as well suppose that it was ordained that man should lie on his back and have nothing to do but to open his mouth, and the manna of Heaven which "suits every man's palate," would drop into his lazy throat! No, no! man was commanded, not only to replenish the earth, but to "subdue" it.—"In the sweat of thy face shalt thou eat bread," and for our part we have some difficulty in understanding in what sense the necessity for labor should be deemed a curse. "I have already enjoyed too much; give me something to desire," said the Prince of Abyssinia, on being asked if he wanted nothing, how he could be unhappy?

In transplanting a tree, instead of restricting our thoughts merely to its present existence and wants, it is proper that we should consider what is necessary to its *growth and prosperity*, and remember, that it will require nursing and care, such as we would bestow on a young colt—*food* to sustain life and promote growth, and scrubbing and vermifugent medicines to save it from the ravages of parasitic moss, and the internal and external attacks of worms and other insects; and he who is not prepared to provide the food, and to bestow the care here prescribed, to feed and defend it at the root, and to drive off its more open enemies, had better sit down in his sleepy arm-chair, hug indolence to his bosom, and be content to submit to the privations and disgrace that are the just portion of men too ignorant, or too lazy, to perform the duties that belong to their employment and condition in life.

Let him who transplants a tree (and the management of a single one will apply to a whole orchard) ask himself how and where it is to get the elements of its growth? Is it from the air? No! for in that case there would be some chance for its living, when planted in the way we have described; but the support is to come through the roots from the ground. Is it not, then, obvious that we should take care of two things?

1st. That the ground contains the suitable food, and

2d. That it be pulverized and made *easily* accessible to the roots, as far as they would be inclined to go, and that inclination bears a certain proportion to the greatest size that the tree would attain under the most favorable circumstances. Suppose the young tree to be planted, as used to happen, and still does in many cases, in a small hole, in hard, poor land, and then *reverse all these conditions*, as much as possible, and the work will be done in the way that common sense will teach every man it should be done; and that a regard for his own profit and reputation will lead him to do. In other words, let the whole orchard, if it be an orchard, be well manured, then let the *whole field*, not a particular round or square hole just sufficient to admit the roots, but the whole field, be deeply plowed, (if trench-plowed, so much the better,) and well pulverized, and so far, and not short of that, the Farmer will have, *up to that point*, done his duty. If the hole be made much smaller than the space which would be ultimately penetrated by the roots, provided they had their way, in well-manured ground, when the roots have extended to the circumferent limits of the hole dug for its reception, *then* will its growth receive a sudden check,

just as would the growth of a fat colt if suddenly put on short allowance, or a calf which had sucked from the whole udder, when restricted to one teat; and the farmer, good, easy man, wonders how his orchard should stop growing! Starvation generates disease, just as vermin are bred in the filth and rags of the lazar. So arborical poverty and sickness will contract moss which at once consumes the substance of the tree, and offers a ready shelter for the thousands of insects on the look-out for exactly such places to deposit their eggs, the young of which, when hatched, again find their natural food in the fruit. A tree, like everything else in nature, when it comes into existence, should be supplied with food and *kept growing*, if you wish it to attain its full natural growth and fruitfulness. The truth of this is illustrated in a thousand ways, for Nature is prodigal in her offers of instruction, if man, whose natural and sluggish tendency is to repose, would only keep his eyes open. What science does she not illustrate? For one instance, suppose a stalk of corn, under favorable circumstances, to reach great size, and to have ears that commence with a large number of rows, promising a prodigious yield; yet if there comes a severe drouth, the ground bakes, the roots are checked, and the air and the earth both become dry, and you will find that the ear of corn which had started with, we will say, 12 rows will contract to ten, and if these distressing circumstances of earth and atmosphere continue, finding that it cannot carry out its second undertaking, it will contract the number of rows again to eight; but, strange to say, it will always preserve an *even* number. All this we remember to have seen exemplified in corn exhibited at Wilmington, Delaware. Some have contended for proof of *intelligence* or volition in the roots of a plant from its selecting food adapted to its growth, and the rejection of that which would be deleterious. This alteration more than once of the design of the corn, to produce a certain number of rows, and its invariable adherence, under all circumstances, to an *even number*, looks yet more like volition or instinct. But let us admire the mysteries that we cannot penetrate and explain. Providence never designed that we should know everything at once, but wisely stimulates inquiry by the lively hope and ambition of new discoveries. In the midst of the deserts of Africa, when on the eve of perishing, the ill-fated MUNGO PARK shook off the despair under which he says he was fast sinking unto death, by seeing in the midst of that desert a delicate spear of moss, at which he said if even that was not beneath the care of Providence, why might he not yet hope to be saved? But to return to our subject. If plants of corn require a certain distance within which to grow, and to have the intervening space manured and pulverized, why should not *trees* require the same advantages in *proportion* to their size. True, the tree demands not, neither does it get the frequent stirring of the land which is indispensable to corn while growing, because its roots are stronger and its natural life is longer; but the tree does require the land to be well manured and well broken, at least when it is planted; and it is only when the planter is prepared to offer it that indispensable guarantee of life, growth, and fruitfulness, that he ought to take its life and managery into his keeping. If he cannot thus care for 100, let him plant 50, and if not 50, let him plant 10. Let him, in a word, in this case and all others, embark in nothing which he does not *mean to do well*, and, thank God and the progress of light and knowledge, the time is coming when the ignorant and slovenly farmer will lose caste and character as surely and as much as the pettifogger is contemned at the bar, among learned counselors, and the demagogue despised in executive offices and the halls of legislation, by true patriots and statesmen.

All this have we written without intending to do more than barely say a word in recommendation and support of the following essay, which we find in the September number of the English Farmers' Magazine. The reader will think that the comment has anticipated, without so well expressing the meaning of the text. Better than either, however, will he find the extract from Mr. DOWNING'S valuable book on 'The Fruit and Fruit Trees of America,' to which it did not occur to us to revert, until we had written to the end of the preceding paragraph. We hope he will excuse us for offering to the reader a draft, which, large as it is, will only stimulate his thirst for more, and prompt him to take, at the original fountain, the book itself, from which we have drawn the chapters which follow the English Essay, for his instruction.

PREPARATIONS FOR PLANTING.

As the season approaches when trees of all kinds may be planted with every prospect of success, under circumstances most favorable to their success, it has been judged fitting to make some allusion to the preparation of land in general, referring to a future opportunity any notice of the soil peculiarly suitable to each.

Trees, agriculturally considered, are great enemies to the crops of the farm; and, as such, many writers of the day have successfully labored to show that, however ornamental they may be in themselves, and to the landscape of the country, their existence, in hedge-rows above all, is an evil, unless it be in exposed situations, where they may act as screens of defence against the violence of prevailing winds.

There are two or three writers of recent date whose works will be referred to, and recommended as guides to readers interested in the culture of ornamental and timber trees. These writers are Mr. Withers, of Holt, Norfolk, who

has written *con amore* upon this, his favorite topic; and Mr. Stephens, of Edinburgh, author of "*The Book of the Farm*," a work which ought to be in the hands of every agriculturist of the new school who is emulous to meet the emergency of the times by the relinquishment of ancient prejudices, and the adoption of new and improved modes of culture.

They who have candidly perused "*The Woodlands*" of the late William Cobbett, must acknowledge that his directions, whether in all cases correct or not, are precise, and intelligible to all. Its style is clear, its rules simple and perspicuous; and, as the author really begins at the beginning, any one who is desirous to do the work of planting effectually, may confide at least in the rules which are there laid down for the preparation of the land, because there is no mystification in them.

It is certain that the beauty of English scenery is mainly dependent upon the multitude of its hedges and hedge-row trees; but, as was proved by a late writer on the Agriculture of Devonshire, the country suffers severely by these ornaments; utility and productiveness are thus sacrificed; and, therefore, as we would have things put in their right places. we at once urge the abandonment of all those harborers of vermin, which cause the waste and deterioration of agricultural grain crops, in more ways than one, without any redeeming qualification, insomuch as the timber and underwood about a farm are, in themselves, of no remunerative value whatever.

But timber is a source of wealth: trees are glorious objects; and plantations adorn a country: therefore we would place them in appropriate situations, and grow them when there to perfection; but, to do so, the preparation of the land is a consideration of first-rate importance.

Trees ought, in fact, to be grown in woods; also, as screens or belts for protections; and in groups, or positions. where, placed singly, they may constitute a prominent and striking feature of park scenery. The late Rev. William Gilpin, in that interesting book, "*The Forest Scenery*," has afforded many striking examples of the effects of grouping, chiefly with a view to *picturesque beauty*; and we recommend the perusal of it to every one interested in the art of planting, for that express object.

But beauty cannot consist with stunted deformity; therefore we must, in the first place, study the soil and its effectual preparation; and upon these points our best writers are perfectly agreed.

Cobbett insists chiefly upon the thorough trenching of the land to the depth of at least two feet, reversing the surfaces if the soil be good to that extent; but he justly qualifies this position by observing that the soil may be such, in respect to its subsoil, "as to bring to the top something in which hardly anything will ever strike root—as, for instance, clear chalk, or pure sand, or gravel, or clay." When this is the case, the top mould must be kept at top; "but still *the trenching is always to be performed*, for the ground must be moved and turned to the depth of two feet." Mr. Withers is not content with trenching or deep plowing; he adds manure to the amount of twenty loads per acre, and says that, "when *you manure*, you never want to fill up, for all the trees are sure to take, and instead of filling up, you may. after the third year, take out and transplant at least a tenth part of them." (Memoirs, 1827.)

Mr. Withers's "Letter to Sir Henry Steuart, Bart., on the Improvement in the Quality of Timber"—1829—is a very valuable treatise, and worthy of being better known.

It is, perhaps, needless to revive the subject of a controversy which once was carried on most strenuously between the advocates of effectual preparation of land by deep trenching, and others who were content to open holes in the ground for each individual tree. "The cheap, hole-digging, short-sighted Scotch system," as it was called some twenty years ago, was "calculated to bring upon those who adopted it only loss and disappointment," that in this day of philosophical inquiry and chemical research, we have little cause to make farther allusion to that which experience must have disqualified. But it cannot be wrong or invidious to inquire into the causes by which deep comminution of soil will contribute to the permanent advantage of every species of vegetation.

Without farther entering into the mechanical processes of trenching, already described in the first part of the articles upon "*Orchards*," it will be relevant to insist upon the agency of those chemical constituents of soil—loams especially—which never entered into the calculation of the earlier writers. Our forefathers knew nothing of analysis; they had no idea of the existence of the phosphates, silicates, and alkalies, which modern Chemistry has brought to light. But now we know, and the knowledge is widely diffused—thanks to the enlightened German chemist, Liebig!—that, by the breaking up and the pulverization of earths, a volume of salts—usually termed the *inorganic* constituents of land—is distributed through the staple earth, and afford to timber those salts, the presence of which was deemed inexplicable.

Thus the thousands of tons of pearl and potashes, that have been articles of commerce to an extent almost unlimited, are now understood to be derived from the soil, and distributed only through (not formed or created *in*) appropriate vessels of the vegetable tissue. The laboration of the ground, therefore, is now proved, beyond question or doubt, to be indispensable, not only, as was supposed, to the first advances of young trees, but to their future progress towards perfection.

Trenching is, in no case, labor lost; and even where a single tree only is to be planted, to produce a particular effect, the hole to receive it ought to be prepared upon the principles of trenching—that is, by opening and comminuting the earth to a very considerable extent and depth, so as to insure good drainage, and the free tracings and extension of the roots, laterally, through a number of feet around the bole of the tree.

They who have traveled extensively, and witnessed the wretched progress of young trees that have been planted in holes so small as to require their roots to be, as it were, screwed into the ground, will want no other monitor to impress the great, undeniable truth, that early and effectual preparation is the only guarantee of success. Let any one try the experiment upon a couple of gooseberry bushes, by planting one in a narrow hole, and the other by expanding its roots in a soil worked and made permeable to the extent of a square yard, and the difference of the results will be sufficiently established before the lapse of two entire seasons. The soil shall be the same—a free unctuous *loam*—and the sites contiguous; yet one tree will be stunt-

ed, while the other shall produce luxuriant and healthful young wood; one will bear early a few starved berries—the other, though not so soon in maturity, will maintain a high state of fertility for, perhaps, fourteen years.

J. TOWERS.

TRANSPLANTING.

As nearly all fruit trees are raised first in nurseries, and then removed to their final position in the orchard or fruit garden; as upon the manner of this removal depends not only their slow or rapid growth, their feebleness or vigor afterwards, and in many cases even their life, it is evident that it is in the highest degree important to understand and practice well this *transplanting*.

The season best adapted for transplanting fruit trees is a matter open to much difference of opinion among horticulturists; a difference founded mainly on experience, but without taking into account variation of climate and soils, two very important circumstances in all operations of this kind.

All physiologists, however agree that the best season for transplanting deciduous trees is in autumn directly after the fall of the leaf. The tree is then in a completely dormant state. Transplanted at this early season, whatever wounds may have been made in the roots commence healing at once, as a deposit directly takes place of granulous matter from the wound, and when the spring arives the tree is already somewhat established, and ready to commence its growth. Autumn planting is for this reason greatly to be preferred in all mild climates, and dry soils; and even for very hardy trees, as the apple, in colder latitudes; as the fixed position in the ground, which trees planted then get by the autumnal and early spring rains, gives them an advantage, at the next season of growth, over newly moved trees.

On the other hand, in northern portions of the Union, where the winters commence early, and are severe, spring planting is greatly preferred. There, autumn and winter are not mild enough to allow this gradual process of healing and establishing the roots to go on; for when the ground is frozen to the depth of the roots of a tree, all that slow growth and collection of nutriment by the roots is necessarily at an end. And the more tender sorts of fruit trees, the Peach and Apricot, which are less hardy when newly planted than when their roots are entire, and well fixed in the soil, are liable to injury in their branches by the cold. The proper time, in such a climate, is as early as the ground is in a fit condition in the spring.

Early in autumn, and in spring before the buds expand, may as a general rule be considered the best seasons for transplanting. It is true that there are instances of excellent success in planting at all seasons, except midsummer; and there are many who, from having been once or twice successful in transplanting when trees were nearly in leaf, avow that to be the best season; not taking into account, that their success was probably entirely owing to a fortunately damp state of the atmosphere at the time, and abundant rains after the experiment was performed. In the middle States, we are frequently liable to a dry period in early summer, directly following the season of removal, and if transplanting is deferred to a late period in spring, many of the trees will perish from drouth, before their roots become established in the soil. Spring planting should, therefore, always be performed as soon as possible, that the roots may have the great benefit of the early and abundant rains of that season, and get well started before the heat of summer commences. For the neighborhood of New-York, therefore, the best periods are, from the fall of the leaf, to the middle of November, in autumn; and, from the close of winter, to the middle of April, in the spring; though commonly, the seasons of removal are frequently extended a month beyond these limits.

Taking up the Trees is an important part of the operation. A transplanter should never forget that it is by the delicate and tender points or extremities of the root that trees take up their food; and that the chance of complete success is lessened, by every one of these points that is bruised or destroyed. If we could remove trees with every fibre entire, as we do a plant in a pot, they would scarcely show any sign of their change of position. In most cases, especially in that of trees taken from nurseries, this is, by the operation of removal, nearly impossible. But although we may not hope to get every root entire, we may, with proper care, preserve by far the larger portion of them, and more particularly the small and delicate fibres. After being taken up, they should be planted directly; or, if this cannot be done, they should be kept from drying by a covering of mats, and when sent to a distance by being packed in damp moss.*

Preparing the places. Here is the fatal stumbling-block of all novices and ignorant persons in transplanting. An English gardener, when he is about to plant fruit trees, talks about *preparing his borders*; an American says he will *dig his holes*; and we cannot give a more forcible illustration of the ideas of two persons as the wants of a fruit tree, or a better notion of the comparative provision made to supply these wants, than by contrasting the two phrases themselves. The one looks upon a tree as a living being, whose life is to be rendered long, vigorous, and fruitful by a good supply of food, and a soil mellow and easily penetrated by the smallest fibre; the other considers it very much in the light of a truncheon or a post, which he thrusts into the smallest possible hole, and supplies with the least portion of manure, trusting to what he seems to believe the inextinguishable powers of Nature to make roots and branches under any circumstances. It is true that the terms differ somewhat from the nature of the culture and the greater preparation necessary in planting fruit trees in England, but this is not by any means sufficient to justify the different modes of performing the same operation there and here.

In truth, in this country, where the sun and climate are so favorable, where pruning and training are comparatively so little necessary, the great requisite to success in the ordinary culture of fruit trees is the *proper preparation of the soil* before a tree is planted. Whether a transplanted tree shall struggle several years to recover, or grow moderately after a short time, or at once start into a very luxuriant and vigor-

* We should notice an important exception to this in the case of trees packed for shipping across the Atlantic. In this case they should be packed only in *dry* moss; the moisture of the sea air being sufficient to keep the roots in good condition, while if packed in damp moss they will be injured by rotting or excessive growth.

ous growth, depends entirely upon the amount of care and labor the planter is willing to bestow on the soil for his trees. We have seen several instances where, side by side, one man planted his trees in large spaces of deeply moved and rich soil, and another in small holes in the common mode, which uniformly showed the trees of the first, larger after five years, than those of the last, after twelve.

No fruit tree should be planted in a hole of less size than three feet square, and eighteen inches to two feet deep. To this size and depth the soil should be removed and well pulverized, and it should if necessary be properly enriched by the application of manure, which must be thoroughly mixed with the whole mass of prepared soil by repeated turnings with the spade. This preparation will answer, but the most skillful cultivators among us make their spaces four or five feet in diameter, or three times the size of the roots, and it is incredible how much the luxuriance and vigor of growth, even in a poor soil, is promoted by this. No after mending of the soil, or top dressings applied to the surface, can, in a climate of dry summers like ours, equal the effects of this early and deep loosening and enriching the soil. Its effects on the growth and health of the tree are permanent, and the little expense and care necessary in this preparation is a source of early and constant pleasure to the planter. This preparation may be made just before the tree is planted, but, in heavy soils, it is much better to do it several months previously; and no shallow plowing of the soil can obviate the necessity and advantages of the practice, where healthy, vigorous orchards or fruit gardens are desired.

The whole art of transplanting, after this, consists in placing the roots as they were before, or in the most favorable position for growth. Begin by filling the hole with the prepared soil, within as many inches of the top as will allow the tree to stand exactly as deep as it previously stood. With the spade, shape this soil for the roots in the form of a little hillock on which to place the roots—and not, as is commonly done, in the form of a hollow; the roots will then extend in their natural position, not being forced to turn up at the ends. Next examine the roots, and cut off all wounded parts, paring the wound smooth. Hold the tree upright on its little mound in the hole of prepared soil; extend the roots and cover them carefully with the remaining pulverized soil. As much of the success of transplanting depends on bringing the soil in contact with every fibre, so as to leave no hollows to cause the decay of the roots, not only must this be secured by patiently filling-in all cavities among the roots, but when the trees are not quite small, it is customary to pour in a pail of water when the roots are nearly all covered with soil. This carries the liquid mould to every hidden part. After the water has settled away, fill up the hole, pressing the earth gently about the tree with the foot, but avoiding the common practice of shaking it up and down by the stem. In windy situations it will be necessary to place a stake by the side of each tree to hold it upright, until it shall have taken firm root in the soil, but it is not needful in ordinary cases.

Avoid deep planting. More than half the losses in orchard planting in America arises from this cause, and the equally common one of crowding the earth too tightly about the roots. No tree should be planted deeper than it formerly grew, as its roots are stifled from the want of air, or starved by the poverty of the soil at the depth where they are placed. It is much the better and more natural process in fact to plant the tree so that it shall, when the whole is complete, appear just as deep as before, but standing on a little mound two or three inches higher than the level of the ground about. This, when the mound settles, will leave it nearly on the level with the previous surface.

Mulching is an excellent practice with transplanted trees, and more especially for those which are removed late in the spring. Mulching is nothing more than covering the ground about the stems with coarse straw, or litter from the barn-yard, which by preventing the evaporation keeps the soil from becoming dry, and maintains it in that moist and equable condition of temperature most favorable to the growth of young roots. Very many trees, in a dry season, fail at midsummer, after having made a fine start, from a parched and variable condition of the earth about the roots. Watering, frequently fails to save such trees, but mulching when they are planted will entirely obviate the necessity of watering in dry seasons, and promote growth under any circumstances. Indeed, watering upon the surface, as commonly performed, is a most injurious practice, as the roots stimulated at one period of the day by water, are only rendered more susceptible to the action of the hot sun at another, and the surface of the ground becomes so hard, by repeated watering, that the beneficial access of the air is almost cut off. If trees are well watered in the holes, while transplanting is going on, they will rarely need it again, and we may say *never*, if they are well mulched directly after planting.

The best manure to be used in preparing the soil for transplanting trees is a compost formed of two-thirds muck or black peat earth, reduced by fermenting it several months in a heap with one-third fresh barn-yard manure. Almost every farm will supply this, and it is more permanent in its effects, and less drying in its nature, than the common manure of the stable. An admirable manure, recently applied with great success, is charcoal—the small broken bits and refuse of the charcoal pits—mixed intimately with the soil. Air-slaked lime is an excellent manure for fruit trees in soils that are not naturally calcareous. Two or three handsful may be mixed with the soil when preparing each space for planting, and a top dressing may be applied with advantage occasionally afterwards, to increase their productiveness. But, wherever large orchards or fruit gardens are to be planted, the muck compost heap should be made ready beforehand, as it is the cheapest, most valuable, and durable of all manures for fruit trees.

Pruning the heads of transplanted trees, at the season of removal, we think generally an injurious practice. It is certainly needless and hurtful in the case of small trees, or those of such a size as will allow the roots to be taken up nearly entire; for, as the action of the branches and the roots is precisely reciprocal, and as new roots are rapidly formed just in proportion to the healthy action of the leaves, it follows that by needlessly cutting off branches we lessen the vital action of the whole tree. At the same time, where trees are transplanted of so large a size that some of the roots are lost in removing them, it is necessary to cut back or shorten a few of the branches—as many as will restore the balance of the system—otherwse the

perspiration of the leaves may be so great, as to exhaust the supply of sap faster than the roots can collect it. A little judgment only is necessary, to see at a glance, how much of the top must be pruned away before planting the tree, to equalize the loss between the branches and the roots.

When it is necessary to transplant fruit trees of large size, the best practice is to prepare them previously by digging a trench round the whole mass of roots, undermining them, and cutting off all roots projecting beyond this line. The trench should be dug at such a distance from the tree as will include all the large and sufficient ball of roots, and it should be done in the spring, or before midsummer, when it is desirable to remove the tree the next year. After all the roots that extend to this circular trench are cut off, the earth is replaced, and by the season following an abundance of small fibres is sent out by the amputated roots, which, when the whole is now removed, will insure the success and speedy growth of the tree. This is more completely the case when the tree is prepared two years before transplanting. A variation of this mode, which has been found quite as successful and less laborious, consists in leaving the trench open, and covering it with boards only, or boards with a top layer of turf. The tree then is somewhat checked in its growth, it throws out an abundance of small fibres into the ball of earth containing the roots, and is the next season transplanted with great ease and safety.

The proper size for transplanting varies somewhat with the sort of tree, and the kind of culture intended. It is, however, a maxim equally well settled, both among theorists and the best practical men, that health, immediate vigor, and duration, are all greatly promoted by transplanting fruit trees of small size—from three to six or seven feet. We are fully aware with what impatience the beginner, or a person who knows little of the culture of trees, looks upon trees of this size—one who is eager to plant an orchard, and stock a garden with large trees, thinking to *gather a crop next year*. The latter may indeed be done, but the transplanting so affects the tree, that its first scanty crop is followed by a long season of rest, and feeble growth, while the plantation of young trees is making wood rapidly, and soon comes into a healthy and long-continued state of productiveness—often long, indeed, before the large trees have fairly arrived at that condition. The small tree, transplanted with its system of roots and branches entire, suffers little or no check; the older and larger tree, losing part of its roots, requires several years to resume its former vigor. The constitution of the small tree is healthy and unimpaired; that of the large is frequently much enfeebled. A stout and vigorous habit—what the nurserymen call a *good stocky plant*—is the true criterion of merit in selecting fruit trees for transplanting.

Trees intended for orchards, being often more exposed than those in gardens, should be somewhat larger—not less than six, or more than eight feet is the best size. For gardens, all experienced cultivators agree that a smaller size is preferable; we prefer plants two years old from the graft. Most gardeners abroad, when they select trees with more than usual care, take what are called maiden plants—those one year old from the graft, and there can be no doubt that, taking into account health, duration, and the ease with which such a tree can be made to grow into any form, this is truly the preferable size for removal into a fruit garden. But we are an impatient people, and it is not till another after century of trial and experience in the culture of fruit trees, that cultivators generally in this country will become aware of the truth of this fact.

The facility with which the different fruit trees may be transplanted differs considerably. Plums are generally removed with most success and after them nearly in the order as follows:—Quinces, Apples, Pears, Peaches, Nectarines, Apricots, and Cherries; the latter succeeding with some difficulty when of large size.

Laying-in by the heels is a practice adopted as a temporary kind of planting, when a larger quantity of trees is at hand than can be set out immediately. A trench is opened, and the roots are laid in and covered with soil, the tops being previously placed in a sloping position, inclining to within a few feet of the surface. In this way they are kept fresh and in good order, until it is convenient to plant them finally. In northern districts, where the autumn is often too severe for planting, and the spring is frequently too late to receive trees in time from nureries farther south, it is a common and successful mode to procure trees in autumn and lay them in by the heels until spring, covering over the tops of the more tender sorts if necessary with coarse litter.

In planting an orchard, always avoid placing the trees in the same spot or near where an old tree stood before. Experience has taught us that the growth of a young tree, in such a position, is weak and feeble; the nourishment suitable to that kind of tree having already been exhausted by a previous growth, and the soil being half filled with old and decayed roots which are detrimental to the health of the young tree.

THE POSITION OF FRUIT TREES. SOIL AND ASPECT.

In our favorable climate many fruit trees will thrive and produce some fruit in almost any soil, except dry sand, or wet swamps. But there is much to be gained in all climates by a judicious selection of soil, when this is in our power, or by that improvement which may generally be effected in inferior soils where we are necessarily limited to such. As we shall, in treating the culture of each genus of fruit, state more in detail the soils especially adapted to its growth, our remarks here will be confined to the subject of soils generally, for the orchard and fruit garden. The soils usually selected for making plantations of fruit trees may be divided into light sandy loams, gravelly loams, strong loams, and clayey loams; the first having a large proportion of sand, and the last a large proportion of clay.

The soil most inviting to the eye is a *light sandy loam*, and, as it is also a very common soil, more than half the fruit gardens in the country are composed of this mould. The easy manner in which it is worked, owing to its loose and very friable nature, and the rapidity with which, from its warmth, crops of all kinds come into bearing, cause it to be looked upon with almost universal favor. Notwithstanding this, a pretty careful observation, for several years, has convinced us that a light sandy soil is, on the whole, the worst soil for fruit trees. Under the bright skies of July and August, a fruit tree requires a soil which will retain and afford a mod-

erate and continued supply of moisture, and here the sandy soil fails. In consequence of this the vigor of the tree is checked, and it becomes feeble in its growth, and is comparatively short-lived, or unproductive. As a tree in a feeble state is always most liable to the attacks of insects, those on a sandy soil are the first to fall a prey to numerous maladies.* The open loose texture of a sandy soil, joined to its warmth, affords an easy passage, and an excellent habitation for all insects that pass part of their lives in the ground, preparatory to rising out of it to attack the fruit, foliage, or branches of the tree.

Such are some of the disadvantages of a light sandy soil; and, in thoroughly examining many of the fruit gardens of the middle States the last few seasons, we could not fail to be struck with the fact that in nine cases out of ten, where a variety of fruit was unusually liable to disease, to blight, or to the attacks of certain fruit-destroying insects, as the curculio, the trees themselves were on sandy soils; while on the other hand, and frequently in the same neighborhood, the same sorts were growing luxuriantly and bearing abundant crops, where the soil was a rather strong loam.† For a few years, the growth and productiveness of the trees upon sandy soil, is all that can be desired; but the trees are shorter lived and sooner fall into decay than where the soil is stronger. If there is any exception to this rule, it is only in the case of the Peach, and judging from the superior flavor of this fruit on stronger soils, we are inclined to doubt the value of the exception even here.

Gravelly loams are frequently much better adapted for orchards than sandy, especially where the loam is of a strong quality, and the gravel is not in excess; and the hardier fruits usually do well on this kind of soil.

Strong loams, by which we mean a loam with only just a sufficient portion of sand to make it easily worked, are on the whole by far the best for fruit gardens in this country. A strong loam is usually a deep soil, and affords during the whole heat of summer, a proper supply of moisture and nourishment to the roots of trees. Fruit trees do not come into a bearing state so soon in a strong as in a sandy loam, because the growth of wood is more vigorous, and fruit buds are not so soon formed; but they bear larger crops, are much less liable to many diseases, and their longevity is much greater. The largest and most productive orchards of the Apple and Pear in this country are upon soils of this kind.

Clayey loams are, when well drained, and when the clay is not in excess, good fruit soils; they are usually strong and deep soils though rather heavy and difficult to work. Trees that will flourish on these soils, such as the Apple, Pear, Cherry, Plum, and Apricot, usually are very free from disease, or insects, and bear large crops. In a moist climate, like that of England, fruit trees on a clayey loam would die of canker, brought on by the excessive quantity of water contained in the soil, but such is not the case under the high and warm temperature of our summers. The finest, largest, and most productive Plums and Pears within our knoweldge, grow in sites on the North river, when the soil is a stiff clayey loam, almost approaching a clay. Those fruits that on light sandy soils are almost worthless from their liability to disease, and the attacks of insects, are here surprisingly luxuriant and fruitful.

It is, however, well to remark, that some varieties of fruit, perhaps from the circumstances of their origin, succeed better on sandy soils than any other; thus the Newtown pippin will only arrive at perfection in a strong loam, while the yellow bell flower is finer when grown on a sandy soil. But these are exceptions to all rules, and what we have already stated, as to the relative quality of soils, will apply pretty generally to the whole of this country south of the Mohawk river; and it may be added that calcareous soils, of whatever texture, are better than soils of the same quality where no limestone is present.

Trenching is the most complete method of improving a soil too sandy, when the subsoil below is of a loamy or clayey nature. Deep subsoil plowing, by bringing up a sufficient quantity of the stratum below, will answer the same purpose. When the subsoil of a sandy soil is sand or gravel, the surface can only be improved by top-dressings, or the application of manures. Top-dressing with clay is the most simple means of changing the nature of such a soil, and it is surprising how moderate a quantity of clay will give a closer texture to light sandy soils. In manuring such soils, we may greatly improve their nature as well as condition, by using composts of peat or bog-earth, swamp muck, or river mud, instead of common barn-yard or stable manure. The former are not only more permanent and better as manures for fruit trees, but they gradually consolidate and improve the whole texture of the soil.

Indeed, no fruit garden, where the soil is not naturally deep and rich, is in *perfect* condition for planting trees, unless the soil has been well trenched two spades in depth. This creates a matrix for the roots, so deep and permanent that they retain their vigor and luxuriance through the drouths of summer and continue for a long time in a state of health and productiveness.

It is difficult to give any precise rules as to *aspect*. We have seen fine fruit gardens here in all aspects. Perhaps the very best aspect, on the whole is a gentle slope to the southwest, because in such positions the trees, when in blossom, are somewhat protected from the bad effects of a morning sun after spring frosts. But, to remedy that more perfectly, it is sometimes the practice to plant on the north sides of hills, and this is an effectual way where early frosts are fatal, and where the season is long and warm enough to ripen the fruit in any exposure. A due south slope is, south of New-York, frequently found too warm for many fruit trees, in soils that are light and dry.

Deep valleys, with small streams of water, are the worst situations for fruit trees, as the cold air settles down in these valleys in a calm frosty night, and buds and blossoms are very frequently destroyed. We know a rich and fertile valley

* This remark applies to the middle and southern portions of this country. North of the 43d degree, a light sandy soil is perhaps preferable as warmer and earlier.

† As an instance in point, the owner of one of the most highly cultivated gardens in the vicinity of Boston was showing us, in despair, some trees of the Seckel pear upon which he could no longer get good crops, or fair fruit, and lamenting the *degeneracy* of the sort. The next day we saw in a neighboring garden beautiful crops of this pear growing with the least possible care. The garden in the first case was a sandy loam; in the second, a strong loam.

of this kind in Connecticut where the Cherry will scarcely grow, and a crop of the Apple or the Pear is not obtained once in ten years; while the adjacent hill-tops and high country, a couple or three miles distant, yield abundant crops annually. On the other hand, the borders of large rivers, as the Hudson, or of some of our large inland lakes, are the most favorable situations for fruit trees, as the climate is rendered milder by large bodies of water. In the garden where we write, a fourth of a mile from the Hudson, we have frequently seen ice formed during the night, of the thickness of a dollar, when the blossoms of the Apricot were fully expanded, without doing the least harm to that tender fruit. This is owing to the slight fog rising from the river in the morning, which, softening the rays of the sun, and dissolving gradually the frost, prevents the injurious effects of sudden thawing. At the same time, a couple of miles from the shores, this fruit will often be quite destroyed. In short, the season on the lower half of the Hudson, may, from the ameliorating influence of the river, be said to be a month longer—a fortnight earlier in spring, and later in autumn, than in the same latitude a few miles distant; and crops of the more tender fruits are, therefore, much more certain on the banks of large rivers or lakes, than in inland districts of the same climate.

WOOL-GROWING AND SHEEP HUSBANDRY IN MISSISSIPPI.

ADAPTATION TO, AND RESOURCES FOR—THE BERMUDA GRASS.

[Extract to the Editor of "The Plough, the Loom, and the Anvil."]

"I wish you could impress upon our planters the immense advantage which would accrue to them from *sheep raising*. I have never seen a country better adapted to, or which could be more profitably used for that purpose, than the worn-out hill lands of Adams, Jefferson, and Claiborne counties. These lands are no longer of much value for raising cotton, or indeed crops of *any* kind which require ploughing, but if thrown out of cultivation for a few years, their barren mounds and unsightly gullies become covered with a spontaneous growth of *Bermuda* grass, which soon hides their deformities with a mantle of rich green. Though the Bermuda is much contemned in *Georgia*, it is *here* highly prized, as forming our most valuable pastures: indeed it supplies the place of *clover*, which you are aware does not thrive here. I have never eaten finer mutton than that raised here, upon Bermuda pastures, without any care or attention whatever. It is one of our earliest spring grasses; drought affects it but slightly, and if kept cropped close, no better sheep pasture can in my opinion be found.

"Among other virtues of the Bermuda, it cleans the ground *thoroughly;* weeds, burs, and briars, are entirely eradicated by it—another reason why it should be prized for sheep pasture.

"The old hills of which I speak, and with which I know you are familiar, if turned into pasture farms would also prove exceedingly valuable for the purpose of raising stock for the New Orleans market. New Orleans is now supplied with beeves from the western portion of Louisiana, and from Ohio, Indiana, Missouri, and other Western States. Those driven from West Louisiana, after a journey of several hundred miles, arrive in such poor condition at their place of destination, that they must be re-fattened ere they are fit for market. Those from the Western States are in a still worse condition; for besides loss of flesh, their confinement for so long a time in boats, without exercise, renders them feverish and often diseased. The Mississippi hill planter, on the contrary, *with properly prepared pastures*, can fatten his beeves at comparatively trifling expense, and placing them on one of our river packets, land them in New Orleans in thirty-six hours!

"In view of these facts, therefore, I have become convinced that did the owners of these lands understand their *true* interests, they would find it far better to invest their surplus capital in the preparation of grazing farms, than in Louisiana swamp lands, and *more* negroes, to swell the aggregate of a cotton crop already too large. There is much to be done ere the agricultural resources of the South are properly developed, and that proper division of labour, &c., established, without which her prosperity cannot be perpetuated; and should these crude views meet with your approbation, you can do much toward effecting the change, through the columns of your influential journal. Pardon the freedom with which I write; but the fact that my first information upon agricultural subjects was derived from a perusal of the files of "The American Farmer," to which my father was a subscriber from its commencement to the period of his death, twenty-five years ago, in Queen Anne county, Md., I feel as though I was addressing an old friend.

"With earnest wishes for your continued health and prosperity,

"Yours, WM. H. JACOBS."

We should be at a loss what to say, if we had room to add any thing, to Mr. Jacobs's interesting letter. The first thing that occurs is, to reiterate our exhortation to farmers, to *think*, to *inquire*, and decide with manful independence of judgment, whether they may not, now and then, deviate from the course of their forefathers! The whole world besides is in a state of transition and progress. Steam alone would and has revolutionized the relations, pursuits, and business of men; and, though not practically applied to the extent that it might and ought to be, to the practical operations of cultivation and husbandry, yet indirectly it affects the interests, and ought to work a corresponding change in the business of the farmer and planter. Of this there could be no better illustration than that given by Mr. Jacobs in the above letter. While it might be injudicious and unprofitable, in the Adams county planter, to send a bullock a-foot to New Orleans, it becomes quite another problem, when he can send him there in a steamboat, in the highest condition, in thirty-six hours. Is he, then, to remain stationary and unchangeable in his course, while all the world besides is adapting itself to the changes suggested by this mighty agent, to the purposes of transportation by land and water? Why does not the planter of Calvert and St. Mary's counties, or the farmer of Queen Anne's or Talbot county, Maryland, continue, as formerly, to order himself a new coat and knee-buckles and breeches, and fair-top boots, and fatten up his horse, or go on board of a bay-craft, and sleep in its hold, on bags of wheat, on a three days' journey to Baltimore, as formerly, even within our remembrance? It would be quite as reasonable as not to avail himself of other advantages offered by steamboats and railroads.

As for the *quality* of Mississippi mutton, nothing has been to us more remarkable than its excellence—as we have found it there at public and private tables—and an eminent officer of the army, observant of every thing worthy of observation, Gen. Jessup, has told us that he has nowhere found it better, if as well flavoured and fine, as that which is pastured in the country back of Baton Rouge.

Now what more could or can we do, to illustrate the advantages of a much more extended attention to, and practice of, "*sheep husbandry in the South*," than to prevail, as we did, with the best qualified gentleman we knew, in the whole circle of our acquaintance, (H. S. Randall, Esq., of Cortland village, New York,) to indite a book under that express title? one which leaves nothing unsaid on the subject, that any one need to know, whether it be the practical sheep-breeder, or the mercantile, manufacturing, or politico-economical inquirer into that subject? Yes, such a book, discussing it in all its aspects, and illustrating by portraits and diagrams all that needed to be thus exemplified, is, for not exceeding $1, at the command of every one who would desire (what every one should wish) to know all about the various breeds of sheep—their anatomy—food—diseases—treatment, and economy of every sort.

We might, and perhaps may, reprint some chapters from this work, designed expressly to explain how far, and to what breeds of sheep the South is adapted, demonstrating the profits that would attend that branch of husbandry, with ample discussion as to pasturage, management, &c. But to this there is the objection that many of our readers already possess the work—that after all much of the book would have to be omitted, and, finally, considering that it is in itself a distinct subject or branch of business, of primary importance where circumstances invite the pursuit of it—and one which no gentleman aspiring to be well-informed in the literature as well as the practice of agriculture ought to deny himself for the pitiful consideration of saving one dollar.

MANUFACTORY OF WOOLLEN CLOTH IN THE U. S.

HISTORICAL.

Could any one awake, and in his senses, imagine that this manufacture, so essential even to national independence, had been so recently introduced? But is it any worse to send to England for our clothing than to send there *for coal and iron!* We used to send "home," as it was called, for saddles and bridles, and why not do it now? True, we have the hides to make the leather, and the bark to tan the hides, but have we not also the coal cropping out and the iron ore scattered all over the country, and millions of acres of the finest lands and the choicest climate for rearing wool? Why, before the Revolution, it was admitted, in England, that wool was to be had from Georgia, equal to the best Spanish wool, and there are in her mountain regions (the most delightful climate in the world—Italy not excepted) thousands of acres to be had at very low prices, on which European immigrants would find a paradise—the German to rear sheep, and the Dutchman and the Scotchman to make butter and cheese, if we had a tariff to turn our own resources to account! But the farmer and planter are taught that for him there is nothing like "free trade," under which the over-worked, half-starved pauper labour of Europe can undersell the independent, well-fed labourer of the United States, and thus it is that we play into the hands of the lordly manufacturers of Manchester and Leeds, while we force all who come to this country to go to the West and turn *rivals* of the planter and farmer instead of going into manufacturing enterprises, where they would be *customers* of the farmer and planter! And all this is called *common sense*, forsooth. It certainly requires uncommon sense to see the sense of such a policy.

We do not know from what paper the following was cut, but we think it well to preserve it, where it may be found as a matter of history, which time will invest with even more interest than it possesses now:—

PRIORITY IN CLOTH WEAVING.

Some time ago we published a very interesting letter from an old and favourite correspondent in Berkshire County, Mass., claiming for that county the honour of having introduced the broad-loom for making cloth. The claim is disputed, it will be seen, on behalf of Oneida County, in our own State, by a writer whose position qualifies him to speak with knowledge on the subject, and whose communication we subjoin:—

Messrs. Editors:—In a late number of your paper I noticed an interesting letter, written at Pittsfield, Berkshire County, signed N. S. D. and dated March 15. The initials of this letter are my own slightly transposed, and some persons, who know me, in this vicinity, and who also know that I have long been engaged in the manufacture of woollen goods, supposed me to be the author. I am induced, for this and some other reasons, to undertake the correction of some mistakes into which the author has no doubt unintentionally fallen.

N. S. D. speaks of a power-loom having been used in Pittsfield in 1806, or at farthest 1808, by Mr. Scholfield, for the manufacture of broadcloth. The power-loom had not then been invented, even for cotton goods; and it was some years after they had been introduced into cotton-mills, before it was supposed possible to weave broadcloths in a power-loom. Indeed, it is not much over twenty years since the first introduction of the broad power-loom.

If I am not wrong, my old friend Abraham Schenck, now deceased, first made use of the broad power-loom at the Glenham woollen factory, near Fishkill, Duchess County, now in successful operation under the management of his noble-hearted brother, Peter H. Schenck.

There is something in this letter about a statement made by Samuel Lawrence, in the Merchants' Magazine. I have not seen the statement, but if Mr. Lawrence says that a woollen factory, built in Rhode Island in

1813, was the first woollen-mill built in the United States, he is widely in error.

The Oriskany Manufacturing Company was incorporated February 16, 1811, with a capital of two hundred thousand dollars. The company, in anticipation of an act of incorporation, commenced their present main manufacturing building in the year 1810, on what, at that early day, was considered a very large plan; that is, they erected a capital building of brick and stone, three stories high, besides the basement and attic, and filled it with the best machinery that could be obtained.

This mill was erected upon land which was purchased of the late Col. Gerrett G. Lansing, near the Oriskany Creek, in the town of Whitestown and county of Oneida, during embargo times, and when we were on the eve of a war with Great Britain. Dr. Seth Capron, an officer of our Revolutionary army, formerly of Cumberland, Rhode Island, one of the most enterprising men of that day, two of whose sons are now among the most respectable men and successful manufacturers in this country, first devised the plan of commencing this manufactory, and soon enlisted in the patriotic enterprise a great many of the leading men of the State, of both the great political parties of that day. Among the first subscribers to its stock are found the names of Jonas Platt, Thomas R. Gold, Nathan Williams, Gerrett G. Lansing, and his brother the chancellor, De Witt Clinton, Ambrose Spencer, William G. Tracy, Newton Mann, Smith Thompson, Theodore Sill, John Taylor, Francis Bloodgood, Stephen Van Rensselaer, Morris S. Miller, Arthur Breese, Solomon Wolcott, Elisha Jenkins, &c., thus lending their names to what was then deemed a great and patriotic enterprise—not in the expectation of enriching themselves, but in the hope that their example might induce others to embark in like enterprises; thereby rendering our country measurably independent of Great Britain, at least for the clothing with which we were covered.

The company commenced the business of manufacturing woollen goods immediately, and have been steadily moving on from that day to this in the production of woollen fabrics—said, by many, to be inferior to none manufactured in this country.

It is within my recollection that the satinets made by this company have been sold at $3·50 per yard by the case, and retailed at the stores in Utica and Whitesborough at $5 per yard, while their broadcloths sold at retail at from $12 to $15 per yard.

In 1812 this company paid for their wool an average price of 80¼ cents per pound, and in 1814 the average price was $1·15 and $6·10 per pound.

The spindles first used in the factory were brought from England in 1796, by William Goss, the father of the present superintendent of the mill; and were first used by George Booth, of Duchess County, who charged 2*s.* admittance to persons wishing to see them in operation.

The Oriskany Manufacturing Company wove the first woollen yarn ever woven in a power-loom in the United States. This was a narrow loom, for cassimeres, made at the Oneida factory, in 1818, and started by William Graham, an accomplished weaver and excellent man, who, I believe, is yet living in the northern part of this county. Mr. James Goss, the present superintendent, performed the first work that was ever done by machinery in this mill. He was then a boy, and worked upon a machine called a billy, which is used for slubbing wool. We paid at that day fifty dollars a month for good slubbers, as they were called. We do not now slub the wool at all, but spin direct from the carding machines. We then paid 1*s.* 6*d.* per pound for spinning the yarn, after it had been slubbed, which was quite an expensive operation. We now pay about 1½ cents per lb. for

spinning, and dispense with the slubbing altogether. We then paid from 50 to 56 cents a yard for weaving broadcloths; we now pay from 3 to 5 cents per yard for weaving on the power-loom. We then raised the nap by hand; and it would take the labour of forty men to do what is now done upon one gig with two boys. We then sheared with large hand-shears, and paid experienced shearers $50 per month; it would take more than one hundred men to shear the cloths that are now sheared in this mill, with the aid of machinery, by four girls.

The first agent of the mill, upon the ground, was Colonel Garret G. Lansing, a continental officer, whose memory will always be green in the recollection of those who had the happiness to call him friend. The second was Dr. Seth Capron, whose memory is also embalmed in the recollection of all who knew him. Horace Hunt was agent for a short time, and is, I believe, still living. George Hutton, a practical manufacturer, was the next agent. He was subsequently invited to Waterloo, to start a very extensive woollen mill in that place, in which he was eminently successful. He died quite recently. The present agent, S. Newton Dexter, has managed the affairs of the company for the past twenty years, and the superintendent is James Goss, who has now been practically engaged in the business for thirty-nine years. Our agents in New York are Wolcott and Slade, No. 13 Broad street.

S. N. D.

P. S.—I am wrong in supposing that the first broad power-loom was started at Glenham; my friend James Shepherd started the first broad power-loom, as I am credibly informed, at Northampton, Massachusetts.

A FREE TRADE NUT.

Massachusetts has nearly 800,000 inhabitants; is rich in labour, wealth, and prosperity—her people are all producers and manufacturers. They live in peace and plenty, and command the attention of the people not only of sister States, but of foreign countries also. Of them her people buy the *raw material*, and manufacture all they consume, profit by their own industry, reap the earnings of those who bow to their skill and enterprise, pocket the interest upon all their own and much of their neighbours' capital, draw within her borders the cream of enterprise, talent, and learning, and reward all according to their dues, owing the world around them nothing, and see with a clear and unclouded vision naught but success and prosperity ahead.

Why is this? Thus:—

She pays $1·25 for a bushel of wheat, and gives in pay 25 yards of brown sheeting at 5 cents per yard. She pays 60 cents for a bushel of corn, and gives in pay 1 yard of super. satinet. She pays $12·00 for a barrel of beef, and gives in pay 6 yards of super. broadcloth.

Now take a Western State: Illinois, for instance. She is rich in labour, natural soil, and heaven's elements of prosperity. Her people are all producers from the soil, but nothing from manufactures. They live in fear only of crowded corn-markets, and accept of the purchase of her commodity by people from sister States as a boon of gratuity. Of others she buys all her manufactured goods, expends the profits of her own labour in transportation-charges out and in, loses her surplus capital, wastes her enterprise, talent, and learning, owes everybody, rewards none beyond a bare living, and hangs upon the future without any thing but hope.

Why is this? Thus:—

She sells wheat at 60 cents a bushel, and takes pay in 6 yards of sheeting at 10 cents per yard. She sells corn for 20 cents a bushel, and takes her pay in satinets at the rate of $1·50 per yard. She sells beef for $4·00 per barrel, and takes her pay in 1 yard of broadcloth.

Well—what now? Simply this: the agriculturist in Massachusetts receives 25 yards of sheeting for a bushel of wheat, while the Illinoian receives but 6; the difference is, say 300 or 400 per cent. The first receives 1 yard of good satinet for a bushel of corn; the latter one-seventh of a yard; or a difference of 600 or 700 per cent. The first receives 6 yards of broadcloth for a barrel of beef, while the latter gets only one yard; or a difference of 600 per cent.

But, says a knowing one, the Massachusetts man cannot raise the bushel of wheat, corn, &c., to buy the 400, 500, or 600 per cent. more in difference! For the sake of argument, grant it, if you please, that he cannot equal you. Yet his own family, his son and daughter, receive more profit for their labour in manufacturing the 25 yards that *bought* one bushel of wheat *from you*, than you did in growing one bushel for the six yards you *receive*, by 200 per cent.; while the difference between the intrinsic worth of the six yards you receive and the 12 yards they paid for the same amount of sustenance in each case, is the real meat of the nut you have or soon must crack; and you will find it in the hands of politicians, speculators, and freight or transit men.

In other words, bring machinery, and customers to tend them, to your own town, manufacture your own goods, and you, too, will receive 25 yards of sheeting for a bushel of wheat; for the wheat will have advanced in price, having plenty of customers near by, while the sheeting, having no freight and speculators' fees to pay, can be sold for five cents.—*N. Y. Merchants' Ledger.*

ARABIAN CATTLE.

Lieut. Lynch brought with him, from Syria, a male and female of the beautiful Khaisi breed of cattle, which he presented to the State of Virginia. The legislature of that commonwealth, in turn, presented them to the governor, to dispose of at his discretion, to that farmer within the State whom he should judge as most likely to secure the propagation of the breed. Governor Floyd, accordingly, gave them to Col. James Castleman, of Clarke county. The cattle were lately exhibited at Washington, D. C., and a spectator thus describes them in the N. Y. Herald:—

"The khaisis are, respectively, eighteen and sixteen months old, and weigh, the bull 950 pounds, and the heifer 650. The bull is 4 feet 10 inches high, and 10 feet 4 inches in length, from the nose to the end of the tail—the heifer of a proportionate size. They are the most beautiful animals of the cattle kind we have ever seen. Their limbs are as delicate as those of a gazelle, yet strong and well set as those of a race-horse. Their heads have something of the elegance of outline of a deer; their nostrils are as thin and flexible; their feet are broad and flat, yet delicate; their tails, thick and flat at the insertion, taper down to the thinness almost of a whip-lash, ending in a long tuft of silky hair. They are of a deep shining bay colour, and their horns, which are just sprouting, are black as those of a buffalo. When full grown, they are said to stand seven feet high, and the cows are said to yield three half bushels of milk a day."

The stock of the valley of Virginia, it is believed, will be much improved by the introduction of this new breed. Col. Castleman values the pair at $10,000.

THE EFFECT OF HAVING THE LOOM AND THE ANVIL NEAR THE PLOUGH.

HUNDRED OF BASSETLAW—ITS EXTENT AND CAPABILITY.

East Retford, June 29.—This large and influential division of the county of Nottingham (of which the borough of East Retford forms the centre and the capital) contains 197,021 acres of land: of this, 136,969 consist of sand and alluvial soils, and 60,052 acres of clay and loamy soils. Of these 197,021 acres, the following are the purposes to which it is appropriated, viz.: grass, 58,000 acres; grain, 110,000 acres; orchards and gardens, 4360 acres; woods and wastes, 13,358 acres; roads and rivers, 10,863 acres; and hop land, 440 acres. Of the grain land the following are the divisions:—76,000 acres on sandy and alluvial soils, and 34,000 on clay and loamy soils. The portion appropriated to the growth of wheat is on the sand, &c., 19,000; on the clay, &c., 11,300; making a total of 30,300 acres. These, in ordinary years, will produce 131,260 qrs. of wheat, [34 bushels to the acre,] which, after deducting 5500 qrs. for seed, and 26,000 qrs. for home consumption, will leave a surplus of 99,760 qrs. for *exportation to the manufacturing districts.* On the sand lands 19,000 acres are appropriated to the growth of barley, which produce annually 85,500 qrs.; [36 bushels to the acre,] of this the *greater part is used for the purposes of malting.* On the clay soils there are about 5000 acres of barley, which will yield an average of 22,500 qrs. [35 bushels to the acre,] this latter, with some of the former, is principally consumed in the district, in the feeding of cattle, pigs, &c. The remainder of the soil under cultivation is thus appropriated, viz.: in beans and peas, 10,000 acres; in oats and skegs, 17,000 acres; and in tares, &c., 3300 acres. The bean land will give an average yield of 18,750 qrs., of which it is calculated 7500 qrs. are consumed at home, and 11,250 qrs. are sent away. The number of horned cattle fed in the district amounts annually to 13,500; of this, 4750 head are consumed by the inhabitants, and 8750 sent out of the country. The quantity of sheep yearly kept in the district is not less than 197,000, of which 78,800 are store sheep, and 118,200 are fatted into capital mutton. Of these latter the total number consumed at home are about 45,600, leaving 73,600 for the Yorkshire and Lancashire markets. The quantity of wool produced annually amounts to 492 tons, or nearly 40,000 tods. Of cheese is produced 240 tons, (independent of home consumption;) of butter, 380,000 lbs.; of hops, 164 tons; of apples and pears, 1183 tons; of plums, gooseberries, &c. 150 tons; and of potatoes, 16,000 tons: and in the production of all these necessaries of life it is calculated that not less than a million of money is annually employed by the proprietors and occupiers of the soil.—*Doncaster Gazette.*

Here we see again the effect of manufacturers close at hand, on whom reliance can be had to consume the wheat at an average of 34 bushels to the acre—a good deal over double the produce of New York—and to whom can be sold the barley at the rate of 36 bushels to the acre. But in England, those who manufacture for the farmer have their looms and their anvils close to the plough, while in America, those who are appointed by State Agricultural Societies to discourse on the politics of agriculture, tell the people of these republican, self-governing United States, they must be prepared to compete against the world in "the great grain markets of the world,"* or take the consequence and live—if it may be called living—in a state of yet greater destitution and degradation, than do

* See Governor Wright's Address to the New York State Agricultural Society.

those in Europe and Asia, who supply provisions to the British manufacturer to be consumed in the preparation of cloth and iron, and these, thus compounded of the produce of foreign ploughs, to be sent and consumed by the cultivators of the soil in the United States! Assuredly we are *a very wise—a very wonderful people!*

In this very fertile and very productive division of the county of Nottingham, on the other hand, almost every thing is consumed within the county, and the refuse of the land returned to the land. The cattle and sheep that are not consumed on the land are fattened on the land, and thus the elements of the crops are restored to the land that produced them!

DRAINING.—ITS IMPORTANCE OVER-ESTIMATED IN THE UNITED STATES,

IN THE JUDGMENT OF THE PRESIDENT OF THE AMERICAN INSTITUTE.

A FEW pages of the last number of this journal were appropriated to the consideration of the remark by General Tallmadge, as President of the American Institute, in the last of the *six* orations delivered at its Fair of 1848, and all published at the expense of the State of New York, for the benefit (?) of American agriculture—besides the State's annual contribution of $950 cash, to the same Institute. The remark to which we referred, made in an avowed spirit of deprecation, was this:—"*English books on agriculture are our principal sources of instruction!*"

We have now only to re-affirm, on reflection, that if the orator had studied to lay down a proposition, the reverse of accuracy in the premises, he could not have hit upon one more happily adapted to his purpose.

With the exception of "THE FARMERS' LIBRARY," in half of which, under our humble supervision, there had then been recently re-published, "VON THAER'S PRINCIPLES OF AGRICULTURE," and "STEPHENS'S BOOK OF THE FARM," (two among the most valuable "books on agriculture" that ever were, or probably ever will be, published in or for any country,)—with that exception, let any man take up any volume of American agricultural annals, and on examination he cannot fail to be impressed with their uniform and nearly exclusive reference to *our own climate, staples, and experience;* almost to the total omission of all foreign matter, rarely even quoting, as they might do, the results of severe scientific investigations by *really* learned men abroad, at least for the establishment of important principles in the art, applicable to all times and all countries. For the truth of this affirmation we confidently appeal to every brother editor of the agricultural press, and to every gentleman conversant with the sources which *have really* constituted our principal dependence for agricultural information.

In the same ponderous book of "*Transactions of the American Institute,*" (distended in volume like that "*bladder of imitation-English lard*" for which they gave one of their very *rare* and very *costly* "Dips:" as a premium!)—and made up of contents selected by—who knows?—in that ponderous tome, of more than 800 pages, the learned Secretary read a "translation *made by him,*" from the Portuguese, because, as he avers with equal elegance and truth, "we find in it a strong and original sense for which we often look in vain across the Atlantic ocean." Thus there is no violence in the presumption, that both the President and Secretary of that illustrious Institute had in view the transatlantic volumes above referred to. Be that as it may, the Lord deliver the agricultural public, say we, from judgments such as this pronounced by "Judge Meigs."

On the whole, in respect of both these anathemas pronounced by the

President and the Secretary of the American Institute, against "books" coming "from across the Atlantic ocean," may it not be asserted, without fear of contradiction, as a "fixed fact," that such declarations belong to the category of Mr. Jefferson's "false facts?"

And now let us proceed to the President's declaration, as to the importance of "draining" in the United States—to wit: "Our climate," says he, "is arid, and our soil is dry loam and sand. A place suited to draining is the exception and not the rule, in this country. During our summer drought, the fountains are dried up, and vegetation burned. It is hard consolation at such a crisis, when his *flocks are lowing* for drink, to ask the husbandman to read a book on 'draining,' and directing the use of lime and guano, (good in their place,) which experiment has shown to be destructive of all vegetation on this dry soil."

Now, so far from draining being rarely necessary in New York, because it lies south of England, or for any other reason, the observing farmer travelling south of New York, through New Jersey to Philadelphia, scarcely ever loses sight, through the whole route, of land that would not be essentially meliorated and fertilized by better surface-draining, and a large portion of it by thorough under-draining; however expensive, if the owner had the means to accomplish it, as we doubt not many of them have. There are, it is but too true, *dilletante* farmers, looking superficially at the subject, who imagine that ditching and draining are only needed in low bottom lands, to relieve them quickly of the contents of great August thunder-gust freshets, and of the visible oozings of springs and stagnant pools upon the surface. By such farmers, among whom we presume not however to include the venerable President of the "American Institute," nothing is easier than to fulminate their dogmas against the importance of draining in the United States; proving thereby, not that the land does not need to be drained of its superfluous moisture, but that their own brains require to be drained of superficial, to be superseded by more practical knowledge of agriculture. Here we might quote the man who, in England, has most elaborately and philosophically treated all the means of agricultural improvement, and who says expressly: "It has been forced upon me, by long and extensive observation of the state of the soil over the greater portion of the kingdom, that the neglect of draining is the cause of most of the bad farming to be seen, and that not a *single farm* exists, not already thoroughly drained, which would not be much the better for draining." But, well aware how easy it is for every one, however small may be the measure of his practical experience or observation, to answer all arguments drawn from English books, even when resting on immutable principles of universal application, with the stale suggestion, old even to mustiness, of "difference of climate;" and duly impressed, too, with the *weight* of the opinion expressed by the learned Secretary and translator for the American Institute, that for any thing containing "a strong and original sense we often look in vain across the Atlantic ocean;"* we shall discard all testimony derived from "English books," and turn exclusively to *American authorities* for proof, not only of the value of "draining," but of its *general* applicability, *and particularly in the State of New York!* True, what we shall quote may not be the opinions of men speaking "under the auspices of the American Institute," but is it entitled

* What a blunder must not the New York State Agricultural Society have committed in the judgment of the President and learned Secretary of the American Institute, when it invited Mr. Johnson to come over from England to deliver its annual oration at the next State Fair—a man known to us through English books, some of the best of which are his own, for his great scientific attainments.

to the less respect for coming, as the proof does on which we shall rely, from plain men of much personal experience, who speak "*of that which they do know?*" Going back, then, only twenty-nine years ago, to the second volume of "The American Farmer," (the first not being at hand,) and, omitting all our own exhortations from that day to this, to the farmers of the Union, to see that their lands are thoroughly drained of superfluous moisture as the *first and most indispensable step* in any course of improvement; and omitting also all illustrations drawn from "English books," for the reason that they are under the ban of the "American Institute," let us go at once far south, to a climate and soil more arid and dry even than that of New York, and we find in an able address by Dr. T. S. BELLINGER, before the Farmers' Society of Barnwell District, South Carolina, the following:—"Indeed," says the doctor, "the injurious effects of too much moisture even upon lands that *apparently do not require draining*, is so manifest, that were it the custom of farmers to devote a much greater period of every spring to the cleansing out of old drains, *and forming more new ones*, than is generally done, *each crop would fully reward them* for this extra work." Now this opinion of an enlightened planter is founded, the reader will observe, not only on experience in our climate, where (according to what is published by the State of New York) the need for draining "is the exception, not the rule;" but in South Carolina, in latitude 32°, being 9° south of New York, according to the President of the American Institute.

We will now come along northwardly, stopping, however, in the Old Dominion, where the climate is as "arid" at least as in New York, and we find in the second volume of "The American Farmer," (1820) (which work might, we apprehend, well take the place of the many trashy novels,* and matter equally out of place in the library of an "*American* Institute,) the following opinion by an enlightened Virginia farmer:—"Land of every description should be cultivated full eight inches deep, and be well mixed. It is then capable of the greatest production, *provided* (at all times) that care has been taken to dispose *of all superabundant moisture.* This, sir, is the indispensable of farming productively." And yet, in a latitude far north of that, the doctrine is gravely promulgated by the State of New York, to be scattered like oak leaves among farmers as premiums for excellence in agriculture, that "draining," recommended in "English books," is not worthy of being dwelt upon, as material in our country, and especially in New York!

This "draining," mind you, reader, was pronounced, twenty-eight years ago, and that in Virginia, to be "*the indispensable in farming productively,*" and from that day to this, we have never seen it questioned, until now, and that by the head of the "American Institute," and the discovery published and circulated in its name, by the legislature of New York! But for these opinions being thus promulgated by such weighty authority, we should not have deemed it, as we have done, under the circumstances, a matter of *duty* to contest them.

Coming down, next, to the present time, the Hon. WILLOUGHBY NEWTON, also of Virginia, who has no superior and few equals as a practical farmer anywhere, in a capital essay on the subject of draining, (for essays on which it seems the Maryland as well as the New York State Agricultural Society in time past, had so little discernment as to offer premiums,) sets out by declaring, in his excellent dissertation:—"There is *no improvement* in agriculture which seems to have been *so much neglected*, and the *profits* of which are so little understood."

---

* Will some one enlighten the public with a list of them?

We would commit ourselves to publish (as we may yet do) the whole of this admirable essay, notwithstanding the fiat of the President of the American Institute; were it not that we are much pressed for space, and that the plan of this journal requires us to illustrate improvements rather by an explanation of the principles involved in them, than by a statement of details of results, however clear and conclusive, as this is from one of the crack farmers of the Old Dominion. For ourselves, until we met with this denial of the importance of draining, and its very wide applicability to lands *in the United States*, we had considered these points as for ever settled, and only wanted to find, in some form not yet familiar to the American public, some more brief and perspicuous illustration of the *philosophy of the operation*—such as "he who runs may read;" and such an one the reader will find in this number of "The Plough, the Loom, and the Anvil,"—being an "Essay on the preparation of the soil for seed," which incidentally exemplifies the importance of draining, and from the value of which nothing can detract, unless it be the objection in vogue at the "American Institute!" that it comes from across the Atlantic ocean, and is to be found in an "English," or rather a Scotch "book!" But why multiply proofs in support of the importance of understanding and applying the principles of draining, notwithstanding the great discovery that America is not England, and even though our climate is arid and our land is "dry loam and sand?" Let any one turn to the index of any one of the agricultural journals of the United States, from 1819 to 1849, and see if he does not find the great importance and value of "draining" and of "*lime*" most prominently urged, from South Carolina to New Hampshire, and the neglect of them condemned and rebuked by men whose public spirit and practical knowledge entitle them to rank even with the high officers of the American Institute, unless it be, perhaps, with the learned Secretary and author of innumerable translations "*made by him*," (not by anybody else, mind ye, reader, but as in every instance you are reminded, "made *by him!*") from the Dutch, the French, the Latin, the Spanish, and the Portuguese—among others, "*O-Aux-i-li-a-dor-da-In-dus-tri-a-Na-ci-o-nal.*"

"Mr. MEIGS read the following translation, *made by him*, from the Portuguese, viz.:—

'*O Auxiliador da Industria Nacional.*

'*June*, 1846, *Rio de Janeiro, Brazil.*'

'Vires industria firmat.—VIRGIL.'

"We translate the following from this volume with great pleasure, not because *it is American*, but that we find in it a strong and original sense for which we often look in vain across the Atlantic ocean.

"The continents of North and South America have a great part to play in the history of the earth. Stretching from *ice to ice*—almost from the arctic to the antarctic circles, they contain all climates, all forms and qualities of earth, and are destined to be the theatres of grand events." P-r-o-d-i-g-i-o-u-s!

[See "Transactions of the American Institute, 1847," page 730—being part of the proceedings of the New York Farmers' Club, published, not by the Institute, but by the State, to be distributed in the *name* of the Institute as premiums to promote agricultural improvement.]

Thus it would appear that the President of the Institute, and the Secretary thereof, (appearing as such—always as such—at the head, and again at the tail, of the proceedings of the "*Farmers'* Club of New York," as published by authority, in that in all else really valuable periodical, "THE FARMER AND GARDENER,") vie with each other in their low estimate of books coming from "across the Atlantic ocean." The only curious puzzle in the case is, that

the proceedings of the New York Farmers' Club, published by the State of New York, "at some considerable expense," should be so stuffed to redundance with "translations *made by him*," from all sorts of languages on so many subjects, not, as all will admit who can take the time to read them, always of *practical* importance to the real hard-fisted, clear-headed farmers of New York, or of any other State; for it is to be observed that at these meetings of what are called "*farmers*," be the subject appointed for discussion what it may, the session usually opens with:

"Mr. Meigs read the following translation, *made by him!*" Thus at the next meeting, again, (page 736,) the regular question being, "Whether manure ascends or descends," the first thing we find is—

"Mr. Meigs read the following translation, *made by him*, (as though that, if a matter of the least importance, might not be *inferred*,) from the '*O Auxiliador da Industria Nacional*,' again, of Rio de Janeiro, June, 1846—beginning with this profound discovery for the farmers of New York, to wit: '*The Roman legislators knew that trees were of high importance!*'"

Following this "translation, *made by him*," come remarks from Dr. UNDERHILL, that *are* worth reading. Indeed, the observations of the doctor, and of Professor MAPES, and C. H. HALL, and COL. CLARK, and MR. WILLIAMSON, and some few others, when we meet them in the mass of verbiage with which they are too much buried up in these proceedings, remind us of Dr. Johnson's commentary on the work of a certain author: "The good things in it are like bits of *gold packed in wool;* but the wool takes up so much more room than the gold, that it is not easy to pick it out."

To return to our subject, and coming next on from the Old Dominion, still nearer to New York, it is seen that Edward Stabler, somewhat known to fame, it must be admitted, as a practical cultivator and writer, says expressly, that he "has not known a case where this operation has been performed with ordinary skill and judgment, that did not fully repay the expense, and in some cases the product was increased from five to ten-fold;" and the beauty of it is that he found it the means of obtaining the soft "consolation" for his "lowing flocks" and his bleating herds.

Col. Capron, too, in a production remarkable for its cogency and clearness—a man whose bold, rapid, and successful measures for the resuscitation of "worn-out lands," are the admiration of every passer-by, in a region far south of New York, says: "The *first application of capital or labour*, after your lands are well enclosed, is to *rid the soil of all superfluous moisture.*" And Mr. Wilkinson, the President of the *Mount Airy Institute*, whose practical knowledge he says expressly was all acquired in the "arid" climate and "dry soil" of New York, maintains, in an essay on draining, which we commend to the particular notice of the officers of the American Institute: "There is no branch of more *general or universal interest*, nor any that seems so infinite in its immediate adaptation to the wants of the producer. Its value is *not confined to any locality*, or its benefits peculiarly adapted to the necessities of any particular set of culturists, but it is of *equal interest to the tiller, in the frigid, temperate, or torrid clime.* In this country, *no state, no county, no town, plantation, or farm, can be said to be beyond the reach of its universal adaptation.*"

Having thus brought two line-of-battle ships into immediate conflict, the President of the American and the President of the Mount Airy Institute, perhaps prudence would admonish us to haul off our frail bark, and endeavour to escape in the smoke, but, as New York is more particularly the battle-ground, (though what we say will not be sanctioned and published by authority of an Empire State,) we yet feel it to be an editorial obligation

upon us to bring into the line of action three more combatants from the same State, whose metal, it will be allowed, is of no mean calibre.

The first is no other than Judge Buel, whose authority "is some," in a controversy of this sort. In the Lancaster School-house, at Albany, where the crowd was so great, that, we are told, the officers of the society could with difficulty get access, he stated in a public address, (we refer again to the American Farmer, we believe not to be found among the many novels of the American Institute) :—

"Another point of *primary* importance in good farming, but in which our country is defective, is the *draining of wet and marshy ground. Much of our best* lands is not only rendered useless by this neglect, but it often becomes the local cause of sickness and death."

Then again, Mr. Pell, of Pelham, one of the chief pillars of the Institute, who executed seven and a half miles of underdraining on so small a space, with such wonderful results, and whose authority will never be questioned at the Institute, he says of draining: "*It must take precedence over all other improvements*, and be considered indispensable to fertility. There is *scarcely a farm in the State of New York*, which may *not be improved by drains*."

Yet another and the last authority we shall adduce, (promising the reader not to trouble him soon again on the subject of "draining,") is the following letter from Mr. Delavan, whose charming residence is near Ballston Springs, *in the State of New York*, a gentleman highly respected for his personal character and general intelligence, as well as the force of his influence and example in the cause of temperance, having led Father Mathew himself in that benevolent and noble enterprise. It will be seen that he too obtained, by draining, the "consolation" of running streams of water for his "flocks lowing for drink," in time of drought.

Ballston, Dec. 3d, 1833.

To Jesse Buel, Esq., President of the New York State Agricultural Society:

Sir:—In reply to your letter of the 27th ultimo, in which you ask me to state to you the result of my experience of the utility and expense of under-draining farm lands. I have to observe, that it is a subject to which I have devoted some attention for the few years during which I have had an interest in agricultural pursuits, and my opinion of its great utility is confirmed by every successive day's observation.

I have applied under-draining to twenty different fields, to the extent of more than two thousand rods, and compute the average cost at half a dollar per rod. The expense, however, is determined by the proximity of materials, and the economy with which the work is performed.

I am convinced the operative farmer, who performs his own labour, can effect similar improvements considerably less than I have stated.

In some instances, the state of my lands required an expenditure of at least $20 per acre in draining. In such cases the production was coarse, unwholesome grasses, of little value, and tillage was quite out of the question. Twenty dollars per acre was the extent of the value of the land; whereas, after being effectually drained and cultivated, these lands have produced Indian corn, oats, wheat, and clover in great luxuriance, paying an income on one hundred dollars the acre.

Every practical farmer is aware of the inconvenience and disadvantage attending the cultivation of fields, the different parts of which are so various as to preclude a uniform crop and uniformity of cultivation. Draining is the remedy for this.

As the improvement here treated of is of the most enduring nature, it would be unfair to charge the expense attending it upon the product of a single year. My belief is, that I have been fully remunerated by the increased products of three years in all cases; and further, in nearly every field I have, at the termination of the stone drains, durable supplies of water for animals, which, in my estimation, fully compensate the whole expense incurred.

Upon the whole, I know of no subject, connected with agricultural improvements, of more importance than draining; and if these facts I have detailed at your request, should lead a single individual to experiment on this subject, I shall deem the hour occupied in the detail, fully compensated. I am, sir, very respectfully, your ob't servant,

Henry W. Delavan.

Now do not all these circumstances illustrate the necessity, when gentlemen undertake to speak, *ex cathedra*, on great questions in practical agriculture, that they should be prepared by some study and experience, with a knowledge of the subject? The opinions of these high officers of the Institute become the more important, and the obligations of agricultural editors to examine them is the more imperative, as we respectfully think, when it is considered that it is under their "auspices" not only that the State now prints and circulates whatever they choose to compile of the "TRANSACTIONS OF THE AMERICAN INSTITUTE," to be disseminated over the whole country, as the quintessence—the very *quinine* of agricultural knowledge; but furthermore, that when the State shall have endowed a grand Agricultural College, it, too, is "to be placed under *their* auspices!"

It is related somewhere by Sterne, that he was once called on by his parishioners in time of great mortality among the cattle, to compose a propitiatory hymn, entreating Providence to stay the ravages of the pestilence. When the day arrived for it to be sung in the church, he told his congregation from the pulpit, that he had no genius for poetry, but that the clerk of his parish had, of which they might judge for themselves by a single stanza, which he read as follows:

"There's Johnny Howe
Has lost a cow,
And so has Billy Bland,
Therefore we'll put our trust in God, and
Not in any other man."

Now, since we are advised by two gentlemen, who in their knowledge of agriculture differ from each other only as "one star differeth from another star in glory," that draining is of comparatively little importance, and that "lime and guano *destroy all vegetation*, and moreover, that for any thing of "a strong original sense, we often look in vain across the Atlantic ocean," we begin to conclude, that our thirty years of agricultural inquiry and observation have been all thrown away—that all that we have read and written, and caused to be read and written, about "draining," would be but a "hard consolation" to the farmer, when his "flocks are lowing for drink"—that the thousands of pages we have given on the *use of* "*lime*," were altogether inapplicable, and that our publication of the analysis of "*guano*," by French chemists, "across the Atlantic ocean," and the distribution of two barrels of the substance itself, twenty-five years ago in Maryland, was only teaching the farmers how, and giving them the means of "destroying all vegetation," and therefore, instead of following our own judgment, we will hereafter enlighten our readers, as Sterne did, by the lucubrations of the clerk of the parish, or secretary of the American Institute, and author of translations "translated by him," and published by the Empire State of New York, as an illustration, *by State authority*, of *American proficiency and progress in the science and practice of agriculture*—the "nurse and mother," as Gibbon says, "of all the arts;" that is, we engage to do so when—we have *nothing else to do—and space to throw away.*

P. S. We have somewhere read that the celebrated Moliere became so captivated with a countryman of his who was a great voluptuary and mimic, and lively narrator of comical stories, that he was always seeking his company, and would often call upon him to raise a laugh among his companions—*fais nous rire*—he would say to him, "Make us laugh." Now, as we hope to get next week among our old *friends* in Montgomery county, one of whom, Quaker though he be, and a septuagenarian at that, yet enjoys a good laugh—should they say to us "fais nous rire," little as we are given to comedy, we should not despair of making them laugh, should

we read these anathemas pronounced *ex cathedra* from the rostrum of the American Institute, and published by authority of the Empire State, against "*draining*," and the use of "*lime and guano!*" and yet more, should we add to them the dictum of the Secretary of the Institute, whose great learning is not disputed, and who in the fulness thereof finds in "*O Auxiliador da Industria Nacional*" of Brazil, "*a strong and original sense for which we often look in vain across the Atlantic*," as relates to agricultural matters!!

The reader who may think we have given too much space to the consideration of an undisguisedly contemptuous denial of the applicability and importance of "draining," as a means of practical improvement, applicable to the United States generally, and especially to the State of New York, ought to bear in mind that this denial was proclaimed by the head of a great "Institute," put forth by the means, and so far sanctioned by the authority of the "Empire State," and that in a volume which they—the Institute—give us to understand is "intended to be indexed for *ready* reference, excluding *uncertain* hypotheses, and including *only* knowledge deduced from *experience* and *accurate* observation, and from sources that *cannot be questioned*, never leading into *mistakes* and sacrifices,"—one which is worthy to be "hailed by every sensible farmer in the nation," and to "do more to *promote* and *dignify* agricultural study, than loads of publications, not, to be sure, *altogether* destitute of useful matter, but interspersed with *false theories*, *fanciful* speculations, and accounts of marvellous productions, extracted, if not *fabricated* on the spot, by the publisher, to *excite wonder*, and to make his work sell."

We have only to add in conclusion, that, if the opinion we have been combating had not come from such authority, we should have deemed it *almost* sufficient to meet it by the following extract from the report of a committee, published by the Agricultural Society of New York, in the last volume of their "Transactions," and the chairman of which—J. Delaplane—is, judging from all we have seen from his pen, undoubtedly one of the ablest investigators of agricultural questions of whom we know any thing.

"There is not," say the committee, "one farm out of every seventy-five in this State, but *needs draining*—yes, much draining, to bring them into high cultivation: nay, we may venture to say, that every wheat-field would produce a larger and finer crop, if properly drained."

Was it, then, on our part, the propagation of a "false theory" or "fanciful speculation" to express the opinion that as much land needed draining in the State of New York as would cover half of Rhode Island—say?

ON THE STATE THE SOIL SHOULD BE IN WHEN THE SEED IS DEPOSITED IN IT,*

AND ON THE BEST METHOD OF DEPOSITING THE SEED.

BY HENRY R. MADDEN, M.D., PENICUICK.

It may, we think, be left to every intelligent reader of the following Essay, to say whether it would not be an improvement on our old systems of education, were such papers to be substituted in all our country schools, for such as we usually find in the "Readers" in common use, such as, "Gods! can a Roman senate long debate which of the two to choose;"—"My name is Norval," &c.?

Why not employ, in the act of teaching "*the art of reading*," such books as will at the same time convey *useful instruction*, in matters which are to constitute the business and pursuit of the boy's life, and by which he is to gain (if he gain at all) his subsistence and an honourable independence? The fact is, that our systems of education were formed and fashioned at a time when the circumstances of our country were entirely different from what they are now. There are now but few large estates to be transmitted from sire to son. Few can afford to have their sons educated and brought up as fine gentlemen, with little or nothing to do but go to the dancing-school, and ride and frolic about the country. The condition of society, and, fortunately, the genius of our people and government, demand that every mother's son of us should *hoe his own row!* The few who have inherited ample fortunes, sufficient to enable them to play the gentleman, and live without work, even they can find so few boon companions in like circumstances, that after lounging a few years about town, in bar-rooms and billiard-rooms, and standing at the corners of streets, until they have become objects of standing pity or contempt among

* Read to a Meeting in the Society's Museum, on the occasion of the Society's Great Annual Show in Edinburgh, in August, 1842.

all intellectual and industrious observers—they get into steamboats and packets, and float off to Europe, leaving their country for their country's good, and finding among the dissipated, the idle, and the profligate, in European capitals, relief from that ennui with which every unoccupied man of any mind must be insufferably oppressed.

Hence the necessity, in our country, for systems of education as *practical* as they can be made; systems under which, every moment, and every action of mind and body, should be made as subservient and as accessary as possible, to the great design of qualifying the future man to gain an honest independence by bodily and intellectual industry, vigour, and acquirement. And why should not the planter and the farmer, the mechanic and the manufacturer, force the government to take measures for the establishment of a school in each State, wherein teachers might be graduated, and then discharged to spread themselves over the country, and under whose instruction, in the schools of the country, the sons of the people might be as thoroughly instructed in the principles of mechanics, civil engineering, and all the various arts and pursuits of civil and useful industry, as are the raw recruits of the army and navy, and regiments of volunteers, by officers educated from year to year, at the expense of the planter and farmer, the mechanic and the manufacturer?—and to whom, when thus educated, the government gives not only the sword, but commissions with ample salaries, enduring and increasing for life, in peace and in war, in a state of idleness as well as in a state of activity, and all placed, in respect of tenure, beyond the reach of vicissitude or accident? Of this we are not complaining, but why not also a school in each State for instructing instructors in the more useful arts of agriculture and manufactures? Has this question been put by any one of the "dear people" to the many candidates for public favour of which this autumnal season of the year is usually so fruitful? No! not by one! The all-absorbing, the sole question is—To what faction seeking to monopolize power and the spoils do they belong?

In civil life, by the time the incumbent begins to exhibit the capacity which some degree of experience can alone impart, he must be turned adrift to "root, hog, or die!" For a Comptroller or Auditor to revise and detect errors of calculation, or acts of peculation, whether large or small, in their accounts for the millions placed in the hands of *military* disbursers, practical familiarity is deemed superfluous. Any measure of knowledge, or virtue, or experience, may do for those in the vulgar line of *civil* service, on whose word millions may be saved or lost; while nothing is more sacred than the life-commission even of a military non-combatant! And even civil trusts, when created and connected with any branch of military administration, have been deemed too good for men accustomed only to the dull pursuits of civil drudgery. As for calling on the government of the people (as ours is called) to make the least provision for education in the *great conservative arts of productive industry!*—such a thing would be deemed in the highest degree chimerical and absurd, if not a treasonable oppugnation to the constitution and *the principles of* '98! Far more exciting to our republican people than the holiest anthems is the sound of martial music—more sacred than if sprinkled with holy water, is a parchment that in the least savours of blood—the "purple testament of bleeding war!" Take, for example, the following essay on the due preparation of the soil, and its proper and best condition for the reception of the seed of the husbandman; and on the principles involved in the growth and ripening of the plant. We will venture to say, there is not one farmer in a hundred, however practical and experienced, who will not, on a careful perusal of it, perspicuous and demonstrative as it is, understand the whole subject to which it relates better than he did before; and better comprehend how it was that TULL, the great and meritorious pioneer of agricultural reform, managed, by perfect tillage, to get heavy crops of wheat, as it is related, from the same land, twelve years successively, without manure.

Well, is there any reason why the boy who is to till the soil, and make his living "by the sweat of his brow," should not, on leaving school, carry all such knowledge with him into the field of practice, just as our publicly educated youngest officer carries with him, into the first field of battle, a knowledge of the practical use of gun, howitzer, and mortar;—and even of the preparation of strap, grape, and canister shot, and all else that belongs to gunnery, pyrotechny, &c.;—rather than be left, as farmers' sons now are, to blunder on for years, in ignorance of the very A B C of their profession, and at last having the knowledge of their business beaten into their heads by years of dear-bought observation—or to be picked up by chance and by piecemeal, as even the knowledge which this essay imparts, will be, should this paper happen to be placed in his hands, by a parent more considerate and careful than, as we greatly fear, most parents are? Ah! we are a wise—a glorious people!—never ridden by demagogues—never gulled by humbugs, nor humbug Institutes!!

It is a source of extreme gratification to all who are devoting themselves to agricultural science, that we have no longer to exert all our energies in an endeavour to draw *attention* to this most interesting study; but that, in dependence upon the favourable excitement produced within the last year or so, we can now proceed with confidence to the illustration of the many varied and interesting phenomena presented to the agricultural chemist, with the assurance that we shall no longer be accused of urging upon your attention subjects with which you have but little to do. No! I rejoice to say that very many of our most enlightened agriculturists have at length confessed the importance of science to the rightful prosecution of their art, and are now fully prepared to lend a ready ear to the dictates of the chemical philosopher. Still, however, the farmer's mind is more in a state of excitement than of patient amd steady inquiry; and it is with great difficulty that he can be persuaded to wait until the newly applied science has had sufficient time to overtake the long-established practice. The farmer is too anxious thát the chemist should at once show him what can be done to *improve the present state* of agriculture, and cannot well understand why chemists are not *at least* as far advanced as he is on the road to improvement.

It is evident that very little reflection is necessary to point out the incorrectness of such a conclusion. It is calculated that two hundred millions of individuals spend their daily toil in the practice of agriculture, and that this state of things has continued for thousands of years; whereas, as regards the science of agriculture, it has never yet occupied *exclusively* the attention of even twenty individuals in the whole civilized world, and even these during scarcely more than the present century. How, then, is it possible that a science so recent and so sparingly cultivated should be capable at once to keep pace with a practice the most ancient, and the most extensively pursued, of all the varied arts with which man is acquainted?

Yet, notwithstanding all these disadvantages, there is scarcely, I believe, a single point in the complicated machinery of practical farming, upon which science cannot already throw some degree of light; and I feel confident that there are very many points, and these among the most important, upon which her knowledge is already so extensive and well-founded, that she is able and willing to proceed hand in hand with the farmer into the wide and enticing field of agricultural improvement.

It is my object in the present lecture to take up but one of the many branches of this complex science, and by it to illustrate two points.

1. I shall endeavour to show the kind of reasoning by which men of science arrive at their conclusions, and by so doing shall endeavour to increase your confidence in our statements; and, in the second place, I shall point out to you how closely connected these conclusions are with the future prospects of your art, and, as a consequence, how much more certain the progress of improvement must become, when its prosecutors are well-tutored in the principles upon which its success depends.

I have noticed with regret that almost all the popular works hitherto written upon agricultural science have fallen into the one common error of endeavouring to make a chemist of the practical farmer; the authors all seem to think it necessary that, in order to the improvement of agriculture, every farmer must study chemistry. In this respect, however, I hold a totally different opinion. It appears to me that it would be a precisely analogous case, if writers on climate had said, that, in order to preserve health, it were absolutely necessary that every individual should study medicine. It is not an extended *knowledge* of chemistry that is required—it is only a *confidence* in the results obtained by chemists that is absolutely

necessary. If the farmer becomes acquainted with the facts as they apply to his practice, and if he has such confidence in these facts that he is willing to act in accordance with them, there is not the least necessity that he should occupy his time and burden his mind with all the abstruse processes of reasoning and experimental proof by which the chemist has been enabled to trace out their connection with the complex phenomena which they serve to illustrate.

I admit that it is requisite, in the first instance, to enter just so far into chemical detail as to convince the farmer of its accuracy; but still I believe that this can in general be much better accomplished, by merely pointing out the connection which subsists between various phenomena, and their mutual dependence on one another, without attempting to follow out, step by step, the chemical reasonings which form the groundwork of these opinions.

I purpose at present to give a short narrative of the various conditions of soil, at the time the seed is committed to the ground, and to point out the manner in which these severally affect the prospects of the future crop. And in so doing, I trust I shall be able to satisfy you, that theory and practice are not such extremely different things as many of you appear to think; but that, in fact, the most perfect theory is in all cases the result of comparing carefully with each other the various facts brought to light by *practice*, and that, in fact, the science of all arts is discovered solely by *looking more closely* into the results of *practice*, and comparing them with each other, for the purpose of determining, as far as possible, their connection and mutual dependence. In the following observations, I shall studiously avoid chemical *detail*, and, when referring to any chemical changes which have occurred, I shall simply name *the fact*, trusting to your confidence in the science for its reception.

The first thing which occurs after the sowing of the seed, is, of course, *germination;* and, before we examine how this process may be influenced by the condition of the soil, we must necessarily obtain some correct idea of the process itself. The most careful examination has proved, that the process of germination consists essentially of various chemical changes, which require for their development the presence of air, moisture, and a certain degree of warmth. Now, it is obviously unnecessary for our present purpose, that we should have the least idea of the nature of these processes: all we require to do, is to ascertain the conditions under which they take place; having detected these, we know at once what is required to make a seed grow. These, we have seen, are air, moisture, and a certain degree of warmth; and it consequently results, that whenever a seed is placed in these circumstances, germination will take place. Viewing matters in this light, it appears that soil does not act *chemically* in the process of germination—that its sole action is confined to its being the vehicle by means of which a supply of air, and moisture, and warmth, can be continually kept up. With this simple statement in view, we are quite prepared to consider the various conditions of soil, for the purpose of determining how far these will influence the future prospects of the crop; and we shall, accordingly, at once proceed to examine carefully into the *mechanical relations of soil.* This we propose doing by the aid of figures.

Soil, examined mechanically, is found to consist entirely of particles of all shapes and sizes, from stones and pebbles down to the finest possible powder: and, on account of their extreme irregularity of shape, they cannot lie so close to one another as to prevent there being passages between them, owing to which circumstance, soil in the mass is always more or less *porous.* If however, we proceed to examine one of the smallest particles

of which soil is made up, we shall find that even this is not always solid, but is much more frequently porous, like soil in the mass. A considerable proportion of this finely divided part of soil, *the impalpable matter*, as it is generally called, is found, by the aid of the microscope, to consist of *broken down vegetable tissue;* so that when a small portion of the finest dust from a garden or field is placed under the microscope, we have exhibited to us particles of every variety of shape and structure, of which a certain part is evidently of vegetable origin. In these figures I have given a very rude representation of these particles; and I must beg you particularly to remember that they are not meant to represent, by any means accurately, what the microscope exhibits, but are only designed to serve as a plan by which to illustrate the mechanical properties of the soil. On referring to fig. 1, we perceive that there are two distinct classes of pores; 1st, the large ones, which exist *between* the particles of soil, and, 2d, the very minute ones, which occur in the particles themselves; and you will at the same time notice, that whereas all the larger pores—those between the particles of soil—communicate most freely with each other, so that they form canals; the small pores, however freely they may communicate with one another in the interior of the particle in which they occur, have no direct connection with the pores of the surrounding particles. Let us now, therefore, trace the effect of this arrangement. In fig. 1, we perceive that these canals and pores are all empty, the soil being *perfectly dry*, and the canals communicating freely at the surface with the surrounding atmosphere; the whole will of course be filled with air. If, in this condition, a seed be placed in the soil, as at *a*, you at once perceive that it is freely supplied with air, *but there is no moisture;* therefore, when soil is *perfectly dry*, a seed cannot grow.

Let us turn our attention now to fig. 2. Here we perceive that both the

Fig. 1.

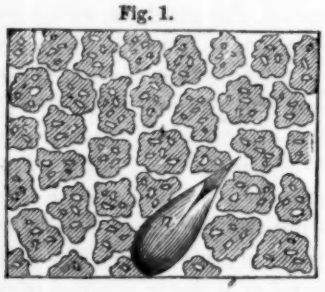
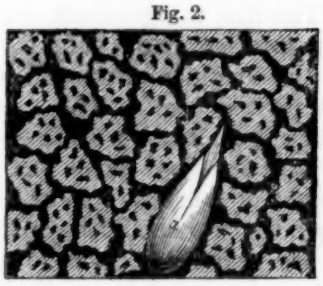


Fig. 2.



pores and canals are no longer represented white, but black, this colour being used to indicate water; in this instance, therefore, water has taken the place of air, or, in other words, the soil is *very wet*. If we observe our seed *a* now, we find it abundantly supplied with water, but *no air*. Here again, therefore, germination cannot take place. It may be well to state here, that this can never occur *exactly* in nature, because water having the power of dissolving air to a certain extent, the seed *a* in fig. 2 is in fact supplied with a *certain* amount of this necessary substance; and, owing to this, germination does take place, although by no means under such advantageous circumstances as it would were the soil in a better condition.

We pass on now to fig. 3. Here we find a different state of matters. The canals are open and freely supplied with air, while the pores are filled with water; and consequently you perceive that, while the seed *a* has quite enough of air from the canals, it can never be without moisture, as every particle of soil which touches it is well supplied with this necessary ingredient. This, then, is the proper condition of soil for germination, and in fact for every period of the plant's development; and this condition occurs

when soil is *moist*, but not *wet;* that is to say, when it has the colour and appearance of being well watered, but when it is still capable of being crumbled to pieces by the hands, without any of its particles adhering together in the familiar form of mud.

Turning our eyes to fig. 4, we observe still another condition of soil; in

Fig. 3.

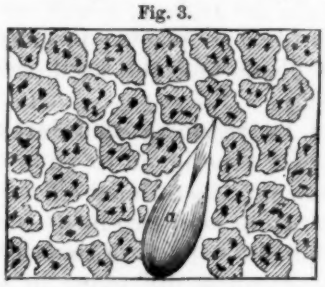
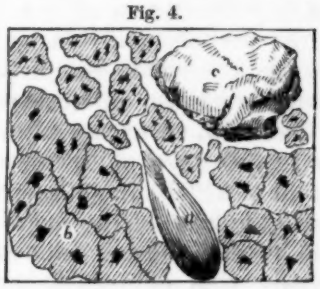


Fig. 4.



this instance, as far as *water* is concerned, the soil is in its healthy condition —it is moist, but not wet—the pores alone being filled with water. But where are the canals? We see them in a few places, but in by far the greater part of the soil none are to be perceived; this is owing to the particles of soil having adhered together, and thus so far obliterated the interstitial canals that they appear only like pores. This is the state of matters in every *clod of earth b;* and you will at once perceive, on comparing it with *c*, which represents a stone, that these two differ only in possessing a few pores; which latter, while they may form a reservoir for moisture, can never act as vehicles for the *food* of plants, as the roots are not capable of extending their fibres into the interior of a clod, but are at all times confined to the interstitial canals.

With these four conditions before us, let us endeavour to apply them *practically*, to ascertain when they occur in our fields, and how those which are injurious may be obviated.

The first of them, we perceive, is a state of too great dryness, a *very rare* condition, in this climate at least; in fact, the only case in which it is likely to occur is in very coarse sands, where the soil, being chiefly made up of pure sand and particles of flinty matter, contains comparatively much fewer pores; and, from the larger size of the individual particles, assisted by their irregularity, the canals are wider, the circulation of air freer, and consequently the whole is much more easily dried. When this state of matters exists, the best treatment is to leave all the stones which occur on the surface of the field, as they act as shades, and thereby prevent or retard the evaporation of the water. We will not, however, make any further observations on this very rare case, but will rather proceed to fig. 2, a much more frequent, and in every respect more important condition of soil; I refer to an *excess of water*.

When water is added to perfectly dry soil, it, of course, in the first instance, fills the interstitial canals, and from these enters the pores of each particle; and, if the supply of water be not too great, the canals speedily become empty, so that the whole of the fluid is taken up by the pores; this, we have already seen, is the *healthy* condition of soil. If, however, the supply of water be too great, as is the case when a spring gains admission into the soil, or when the sinking of the fluid through the canals to a sufficient depth below the surface is prevented; it is clear that these also must get filled with water so soon as the pores have become saturated. This, then, is the condition of *undrained soil*. Not only are the pores filled, but the interstitial canals are likewise full, and the consequence is, that the whole process of the germination and growth of vegetables are materially

interfered with. We shall here, therefore, briefly state the injurious effects of an excess of water, for the purpose of impressing more strongly on your minds the necessity of thorough draining, *as the first and most essential step towards the improvement of your soil.*

The *first* great effect of an excess of water is, that it produces a corresponding diminution of the amount of air beneath the surface, which air is of the greatest possible consequence in the nutrition of plants; in fact, if entirely excluded, germination could not take place, and the seed sown would, of course, either decay or lie dormant.

Secondly, an excess of water is most hurtful by reducing considerably the *temperature* of the soil; this I find by careful experiment to be to the extent of $6\frac{1}{2}^{\circ}$ Fahr. in summer, which amount is equivalent to an elevation above the level of the sea of 1950 feet. So that, supposing two fields lying side by side, the one drained, the other undrained, and supposing them both equally well cultivated, there will be nearly as much difference in the amount and value of their respective crops as if the drained one was situated at the level of the sea, and the other had an elevation as high as the most lofty of the Pentland Hills.* But besides this, and what is nearly equally bad, the temperature is rendered unnaturally high during winter; whereas it has been proved, that one great source of health and vigour in vegetation is the great difference which exists between the temperature of summer and winter; which difference amounts in dry soil to between thirty and forty degrees, while in soil very much injured by an excess of water, the whole range of the thermometer throughout the year will probably not exceed from six to ten degrees.

These are the two chief injuries of an excess of water in soil which affect the soil itself. There are very many others affecting the climate, &c., but these are not so connected with the subject in hand as to call for an explanation here.

Of course all these injurious effects are at once overcome by thorough-draining, the result of which is to establish a direct communication between the interstitial canals and the drains, by which means it follows, that no water can remain any length of time in these canals without, by its gravitation, finding its way into the drains.

The fourth figure indicates badly cultivated soil, or soil in which large unbroken clods exist; which clods, as we have already seen, are very little better than stones, on account of their impermeability to air and the roots of plants. Too much cannot be said in favour of pulverizing the soil; even thorough-draining itself will not supersede the necessity of performing this most necessary operation. The whole valuable effects of ploughing, harrowing, grubbing, &c. may be reduced to this; and almost the whole superiority of *garden* over *field* produce is referable to the greater perfection to which this pulverizing of the soil can be carried.

The immortal Jethro Tull has the honour of having first directed the farmer's attention forcibly to this subject; and so deeply impressed was he with its infinite importance, that he believed the use of manure could be entirely superseded, were this pulverizing carried to a sufficient extent.

The whole success of the drill husbandry is owing, in a great measure, to its enabling you to stir up the soil well during the progress of your crop; which stirring up is of no value beyond its effect in more minutely pulverizing the soil, and increasing, as far as possible, the size and number of the interstitial canals.

---

* Of course the field of high elevation must be *thoroughly* drained to equal even the *undrained* field at the level of the sea.

Lest any one should suppose that the contents of these interstitial canals must be so minute that their whole amount can be of but little consequence, I may here notice the fact, that in moderately well pulverized soil they amount to no less than *one-fourth of the whole bulk of the soil itself;* for example, **100** cubic inches of *moist* soil (that is, of soil in which the pores are filled with water while the canals are filled with air) contain no less than **25** cubic inches of air. According to this calculation, in a field pulverized to the depth of **8** inches, a depth perfectly attainable on most soils by careful tillage, every imperial acre will retain beneath its surface no less than **12,545,280** cubic inches of air.

Taking into the calculation the weight of soil, we shall find that, with every additional inch which you reduce to powder, (by ploughing, for example, **9** inches in place of **8**,) you call into activity **235½** tons of soil, and render it capable of retaining beneath its surface **1,568,160** additional cubic inches of air. And to take one more element into the calculation, supposing the soil were not properly drained, the sufficient pulverizing of an additional inch in depth would increase the escape of water from the surface by upwards of **100** gallons a day, a quantity which would very soon tell upon the dryness of soil, if there were a continuance of dry weather for several successive days, more especially if this were accompanied by sunshine.

From what I have now stated, I humbly hope that you cannot fail to perceive the close connection which subsists between the mechanical condition of the soil and the result of *germination;* and that you have at the same time felt satisfied of the degree of certainty and point which all the processes of preparing the soil assume, when the principles on which they depend are fully understood and appreciated.

Hitherto we have spoken only of the condition of the *soil* at seed-time; we shall now examine into the various methods in use for sowing the seed, and determine what effect these can have upon the value of the resulting crop.

It is well known to you all that, until lately, the grain crops were almost universally sown broadcast upon the furrow slice, which process has the effect of imitating, to a certain extent, the drill-system. A very few considerations, however, will suffice to point out, that with this system of sowing, your success is so far dependent upon the skill of your workmen, that you may be considered completely at their mercy.

To demonstrate this, let us refer to the figures below, which are designed

Fig. 5.

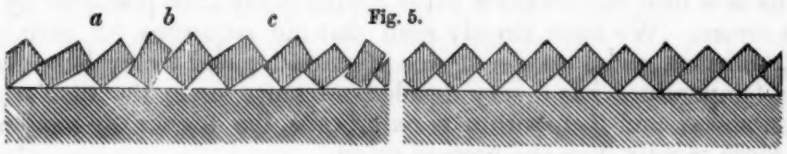


Fig. 6.

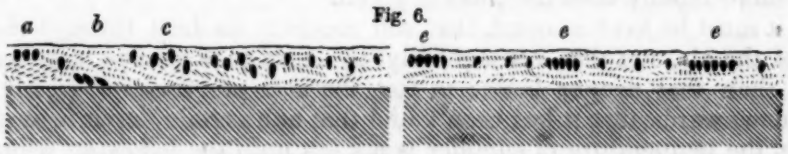
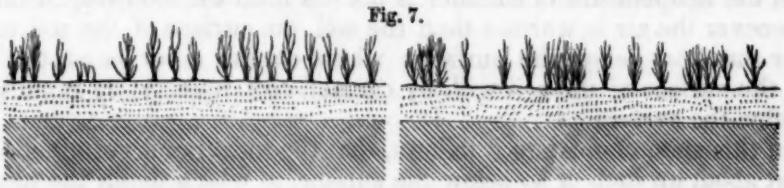


Fig. 7.



to show the effects produced by bad ploughing and bad sowing, as compared with the results obtained by the use of machines.

In fig. 5, you have an example of bad ploughing. You will at once perceive that, in this case, the ploughman has either had a very unsteady pair of horses, or has been but little experienced in his employment.

At *a*, for example, he has given his plough too much land, and has turned over a slice considerably broader than it should be, thus producing, as is shown in fig. 6, a space in which *too much* seed will lodge. At *b* he has laid the slice too upright, thus producing what is technically termed a *proud furrow*, and which in another manner affects the sowing, by allowing the seed to slip down between the two slices, and consequently become buried to far too great a depth below the surface. Again, at *c*, by leaning the plough to the side, he has turned over a slice considerably thicker at the top than the bottom, which, in its turn, will influence the crop by stirring too little soil at certain places, and thus producing an *active* soil of different thicknesses. Besides these, there are various other faults in ploughing which must be familiar to all of you, and which, in the hands of many ploughmen, will be of no rare occurrence; although, as we shall perceive immediately, each one of these errors have a distinct and visible influence on the growing of the crop.

On a field thus carelessly turned over, the sower proceeds to scatter the seed; and here, again, you will at once perceive the effect which the performance of this operation will have on the resulting crop. To the left of fig. 6, I have supposed a good sower to be employed, but still he is labouring under the disadvantage of following a bad ploughman. The figure represents in section the position of the seeds as determined by the condition of the furrow-slice, and you will at once notice several important errors. At *a* there is too much seed, at *b* it is far too deep below the surface, at *c* it is much nearer the surface, and so forth. On the right, again, of fig. 6, I have endeavoured to represent the injury affected by a bad distribution of the seed, even although the ploughing has been performed in the most masterly style, as in the furrow-slices immediately above in fig. 5. In this case at *e* the seed is far too thick, owing to his not having opened his hand soon enough when delivering it out, and on this account the crown of the ridge is much too thinly supplied. This is a very serious, but I fear too common a fault; at least, if we carefully observe the brairding of the fields in spring, there is nothing more common than to see the furrows green, whilst the crowns of the ridges are still nearly bare.

Let us now turn our attention to the results likely to be produced by these various errors. We have already seen that the requisites for germination are air, moisture, and a certain degree of warmth; and I may here observe, that the temperature has a very decided influence upon the time required for germination, and that, within certain limits, the higher the temperature is, the more rapidly does the process go on.

But it must be kept in mind, that soil receives its heat through the medium of the air, and that, consequently, the surface is always more quickly heated than that deeper down; in fact, the heat progresses so slowly from above downwards, that it has been found that at a certain depth beneath the surface, the temperature of summer is not felt until the following winter.

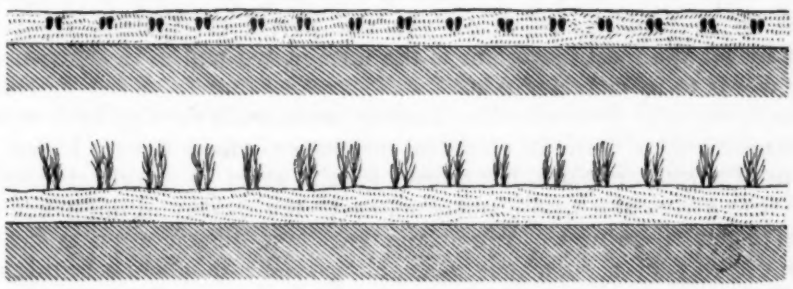
Whenever the air is warmer than the soil, the surface of the soil will be warmer than that below the surface; when, on the other hand, the air is cooler, the surface of the soil will, by contact, cool much more rapidly than that below the surface.

From this state of matters it follows, that the most rapid germination will occur at about an inch or so below the surface, to which depth the heat will soon penetrate, and which, nevertheless, will not be so readily cooled during the night. On this account, the seeds at this level will generally grow most

rapidly, and the germination of others will occupy more and more time, as the distance between them and the surface is increased. It is owing to this fact that seeds too deep sown do not grow at all, the temperature not being sufficiently elevated, and the supply of air too limited to set the chemical processes at work which are essential to germination. In fig. 7, we perceive this result very clearly demonstrated; for, while the plants at one spot, where the seeds were about an inch below the surface, have attained a good size, those which slipped down between the furrow-slices from the bad ploughing, have scarcely yet appeared above ground, as below *a* and *b* of fig. 6.

Turning your attention to fig. 8, you will at once perceive the immense

Fig. 8.



advantage of the machine over the hand-sown crop. In this case, you can work up your land to any degree of fineness you please, by harrowing, grubbing, rolling, &c. You are preserved from every injury arising from a careless distribution of the seed; and even the errors of your ploughmen have not so serious an effect upon the result of the crop. The machine delivers the seed, as in the upper figure, with the greatest exactness, at any depth you please, and the result is, as shown in the lower figure, the greatest equality in the *braird.*

We will now trace, *very shortly*, the progress of our crop towards maturity, and in doing so, we shall perceive that nearly all the ordinary faults in the crop are referable primarily to errors in the cultivation of the soil; errors not so much to be corrected by *science* as by *improved practice.*

The experience of our most enlightened agriculturists have proved satisfactorily, that the ultimate success of every crop depends, in a very great measure, upon the condition of the plants during the *first period of their growth;* that is, from the germination of the seed until the plant has attained some degree of strength, say for the first three or four weeks. If, from any faulty condition of the soil, or the continuance of unfavourable weather, the plants remain in an unsatisfactory sickly condition during this period, they seldom if ever recover their vigour afterwards, and even the most favourable season, during the latter period of their growth, will not compensate for the injury done during the early part of the season. With this fact in view, how careful should the farmer be, that every circumstance as to his soil be so well attended to, that *at least* he should be independent of all defects unconnected with the weather. He should, therefore, by thorough draining, good ploughing, and careful sowing, endeavour to place *every seed sown* under the most favourable circumstances, so that they may all germinate together, and be equally benefited by all the various conditions requisite for the production of a good harvest.

Should these things not be properly attended to, various circumstances may occur that are very injurious to the prospects of the crop, one of the most serious of which is the following:

It should always be borne in mind, that the life of a plant is divided into several distinct stages, each of which has its *defined length;* nay, so fixed are these periods, that it is not difficult to decide the exact number of days required for each in a *healthy plant;* and there can be no doubt, that any circumstance tending to lengthen or diminish any of these periods, has a proportionally injurious effect upon the produce. These periods are four in number, viz., germination, growth, flowering, and the ripening of the seed.

Now, it is well known that if any thing causes the plant to flower *too early*, (thus shortening the period of growth,) the seed never fills so well, neither is the produce by any means so large as when the plant has grown to its proper size before the period of flowering sets in; and, again, it is equally important that the process of ripening *after the seed has filled* should be as rapid as possible. As the period of ripening is upon the whole by far the most important to the farmer, we will in conclusion devote a few words to its consideration.

The ripening of the seed, like all other processes in the vegetable economy, consists entirely of various chemical processes, whose nature I shall not at present attempt to explain, but whose results must be carefully considered in order to arrive at a true conclusion, as to the modifying influence of different modes of culture. When the ear first fills, it appears composed almost entirely of a substance resembling *milk;* in about a fortnight after this, if we again examine the crop, we shall find the seed much more *solid*, the milky juice having hardened and consolidated, and the straw having begun to wither, which it always does from the ground to the ear. At this period, the straw will be yellow for about a foot off the ground,—in another fortnight, the crop will be *perfectly ripe*, that is to say, the straw will be uniformly yellow *up to the ear*, and the chaff will be sufficiently loose to admit of the grain being *rubbed out* by the hands. On examining the ear, the most perceptible difference which has taken place since the last period is, that the skin has become much thicker and harder, while the flour has diminished in quantity. Now, this is the important point, viz., that the last change in the seed is an increase of bran, and a relative diminution of flour, which change increases materially, according to the length of time that elapses between the ripening and the harvesting of the crop.

Bearing this point in view, let us see the effect which bad ploughing will have upon the result at harvest. Those seeds which have been buried too deep will be the last to flower, and consequently the last to ripen; so that if the farmer waits till the *whole* crop appears ready for the sickle, all the early seeds will be *too ripe* by the time that the late ones are sufficiently dry to cut, so that by this error in ploughing, there is a direct loss by the production of less flour from the early seeds, while the farmer is waiting for the late ones to ripen; thus showing that an error committed before seed-time has had its influence during the whole period of the growth of the crop, and has shown itself at last in a considerable loss to the farmer, by his not being able to harvest his grain at the most profitable time.

In the foregoing observations, it has been my constant endeavour to keep out what is merely theoretical, and to dwell more largely upon what has a direct influence on practice, and I have also endeavoured to point out that those who devote themselves to the *true* science of agriculture, by no means confine themselves to chemical detail; but that when they wish really to benefit the farmer, they go out into the fields, watch the performance of every operation, and detect, by personal observation, what is really necessary and what is adventitious; and by so doing, they obtain a fund of knowledge, which, when applied with the aid of the collateral sciences of che-

mistry and vegetable physiology, to the explanation of the phenomena under observation, cannot fail to lead to the most important and *truly practical* conclusions. If a person satisfies himself with *book knowledge* for his practice, and contents himself with sitting in his closet, and drawing up codes of agriculture according to his preconceived opinion of what is right, he will never be capable of rendering any real service to the practical farmer. He may, indeed, by his scientific investigations, throw such light upon some abstruse question as to be of essential service in guiding others who understand both theory and practice into the right path of inquiry; but still I feel confident that the farmer cannot be too cautious in receiving the advice of the *purely scientific*, of those who consider it essential to make *chemists* of every farmer who comes to them for advice; by those he may frequently be misled, but seldom will he be essentially benefited. The man of science who would devote himself to the improvement of agriculture, must himself become acquainted with all the minutiæ of practice. He must approach the farmer on his own footing, and converse with him in his own language; and by so doing, we feel satisfied that he will ultimately gain his confidence and support, and will in fact proceed with much more rapid strides in the field of improvement. And we may ask, in conclusion, *what object can be more noble, and what occupation more gratifying, than the constant and unwearied endeavour to improve an art at once the most important and the most extensively cultivated?*

THE MONTGOMERY COUNTY (MD.) FAIR.

At last we have succeeded in a flying excursion into Montgomery, as far as Rockville, the seat of county government, some fourteen miles from Washington. This Fair we believe was the fourth exhibition of the kind, and, if we could in honesty and fair dealing, we would rejoice to say, that it was a gratifying display of the progressive improvement and high condition of agriculture among a people, if not remarkable, certainly not deficient, either in general intelligence, or in knowledge of what has been done and is doing to push the art of cultivation and husbandry to their highest susceptible amelioration. Whether it was that it has been so long since we had enjoyed the luxury of travelling over an old-fashioned road, at a pace to afford an opportunity of observing the face of the country, and it may be something particularly genial in our *compagnons de voyage*, we know not; but so it is, that to us it had the appearance, both topographically and geologically, of being *naturally* a splendid country. But alas! from the beginning to the end, with rare exceptions, the lavish bounty of nature appeared to have been by man sorely abused and neglected! It needs not an *Esculapius* or a *Galen* to pronounce Montgomery county, so far as we saw of it, the Buenos Ayres of the State—and then how many expanded and beautiful views of the country, as, in returning, you descend from one eminence to the next, until you reach the prominent and commanding "heights of Georgetown!"

The country is undulating and self-drained, and its evident congeniality to the growth of locust and certain other timber would indicate it a fine *farming county*, if the texture and appearance of the soil did not clearly show that it needs nothing to insure recuperation and eminent fertility, but that the loom and the anvil should be in the midst of the ploughs and the harrows: in a word, what it needs is a policy that would tend to the concentration of population and the diversification of employment. Had the action of the government been such, since we achieved our *nominal* independence, as to

bring into full development the water-power, and the coal and the iron, and all the agricultural capabilities of the region drained by the Potomac, Montgomery county would need and might well support 20,000 more able-bodied men in its cultivation and improvement, instead of having her sons driven from her beautiful lands, to rival and undermine in the West the fathers they leave behind them in the East.

Leaving Washington at 2½ P. M., in company with the orator of the day and Mr. George Riggs, we baited, not badly, at Mr. Riggs's beautiful residence, which commands a view of the city of Washington, and the river spreading its augmenting volume as it makes its way past Alexandria, Mount Vernon, and so by [illegible]nous "kettle bottoms," to debouche into the broad bosom of the noble Chesapeake, the grandest inland water in the world.

It may be allowable, and cannot be inappropriate to say, that among other choice things at his hospitable board, *peaches*, unequalled by any thing we have ever seen in that way, crowned the dessert—and what perhaps distinguishes Mr. Riggs's gardener in his unfailing management of that delicious fruit, is *repeated and skilful cultivation*, never planting on the ground *crop of any kind*. Proceeding thence, we called, *en route*, at "*Silver Spring*," the farm which Mr. F. P. Blair is known to have selected in an exhausted broom-sedge country, and with no little of skill, and a good deal of something else, has resuscitated as if by the use of Aladdin's lamp. Far from decrying the example of such men, as is often done in a spirit of ignorance and malevolence, the good of society, much more than their own gratification, demands, that they be respected and honoured for exemplifying the good use that may be made of money applied to agriculture, as well as to things less useful and less exemplary. But there was no time to survey and report upon his farm and his management, further than to make a pleasant visit to the spring itself—a cool and copious fountain of living waters, in which, however, there were to be descried several vessels, whose transparency betrayed contents not exactly such as Father Mathew would pronounce to be identical with that which was administered by that beautiful virgin Rebecca, so "fair to look upon," when she so amiably let down her pitcher, to the faithful servant of father Abraham. The plea in this case—how easy to find excuses!—was that something more lively than cold water was needful to ward off the choleraic tendency of the delicious melons which lie there cooling in the same silver fountain.

Now, readers, who of you will deny that these are agreeable incidents on the way to a cattle-show, not to be enjoyed in the act of flying over the face of the country by your modern contrivances?

Well, then, as to the show itself! How easy—how much more agreeable to paint it rose-coloured—to say that the horses were of the finest form and excellence for all work—graceful, tapering necks—head and ears well set on—shoulders coming up sharp, and well laid back—deep-chested, round-barrelled, and ribbed well home—thighs long, and well muscled—large hocks, and short in the canon bone, with clean, flat legs—action smooth and sprightly—and with all spirit and docility happily combined—that the cows showed the good temper and deep milking qualities that mark a good dairy county, such as one might expect so near the Capitol of the Union—that the sheep were numerous and excellent, and adapted some to the comber, some to the butcher—that the tables were filled with fruits fair and of every choice variety, such as every careful man of the least ambition ought to have, who has even fifty acres of land. How much more agreeable to report all these things, or if the reality forbid going into detail, how easy to salve over all deficiencies by a general description, saying, in stereotype phrase, "The whole affair was well conducted, and did great credit to the enterprise,

good taste, neat management, and general zeal of the farmers of Montgomery!" But the *first* question is—would it be true? and if not true, would it be true friendship to the farmers themselves to say so? Says Burns :—

"O wad some power the giftie gie us,
To see oursels as others see us!"

In respect of the domestic animals, which on such occasions too much monopolize attention, except the most noble team of mules, not, probably, "to the manor born," but caught with a silver lasso; the best single exhibition on the ground was a litter of ten pigs, and their dam, property of Dr. Turner Wooten, of that ilk. They were all well shaped, of even growth, and uncommonly large, showing what may be done by high keep and careful attention, as well in Maryland as in New England, where hogs rarely are allowed to live over twelve months—one of these pigs, now six months old, weighed, just before the show, 185 pounds. They seemed to partake deeply of the Berkshire breed. The cross must have been a genial one, looking at the result. The same sow, nearly black herself, had recently ten more, all pure white, by a Chester boar, and we apprehend not so fortunate a cross. From the same adjacent and handsome farm came, as it was rumoured, a basket of magnificent "murphies," labelled "To J. S. Skinner, from a member of the Montgomery County Agricultural Society."

The next most remarkable feature of the show was a number (much larger in all respects than was to be expected) of oxen well broke, and in size exceeding those generally of Massachusetts, but by no means so compactly and well formed for strength and hardiness. This item of the fair was indeed creditable to the county, evincing a sensibility to the true source of economy in that "arm of the service," with skill to exercise it to the greatest advantage. If they belonged to that immediate neighbourhood, still the wonder might grow, how, to a people so mindful of what is most expedient in a matter so material, should belong a district of country, which, from the road on either hand displays so many briers, bushes, gulleys, and various signs of unthriftiness, deterioration, and—not good management.

There were quite a number of genuine Devons, that exhibited higher blood than keep—for the rest of the stock, with the exception of a very few sheep, there is nothing very emphatic to be said in their praise, and where that is the case, why "the least said is the soonest mended." The ground or grove offered by Mr. Stonestreet, was well fitted for the show, and the collection of farmers, wives, and daughters, was numerous and unsurpassed for appearance, respectability, decorum and politeness on the ground, and hospitality off of it. The fact is, the ladies coming in the force of numbers, of good looks, and in signs of thriftiness, and evident spirit to encourage the best efforts of the harder sex, constituted, as usual, the best part of the exhibition.

Mr. Whittlesey, the well-selected orator of the day, pronounced a very appropriate discourse, full of sound philosophy and sound advice—evincing his well-known good judgment in all things about which he speaks, and, what may not be so well known, great practical familiarity with agricultural details, such as would have justified him in saying as to such as he discussed—*magna pars quorum fui.*

Of the *hams*, we tasted only of that which bore off the first honour to its curer, Mr. Magruder; but if the rest were as good as they looked to be, there is nothing to be seen like them east of the Hudson. Finally, we should say, if a man wants to eat good bacon, and to live to a good old age, among intelligent and good people, far away from the hum of the spindle and the sound of the hammer, and where of course land is cheap and the

people thinly scattered, let him go to the part of old Montgomery which fell under our observation. In the "Sandy Spring" district, which, most reluctantly, we were forced to leave without seeing, it is said they "order things differently."

There every thing is lively and active—the country is improving, comparatively free from debt, from lawyers and from litigation, and when land is to be sold, which is rarely the case, it is quickly bought up at advancing prices. But there the loom and the anvil, the whip-saw and the jack-plane are near to the plough and the harrow.

It would be an improper omission not to say, in this connection, that Mr. ALLEN BOWIE DAVIS seemed to be the mainspring of the meeting, and, as in all cases, and in every thing to which he puts his hand, fulfilled and surpassed the most exacting expectation.

A large party of ladies and gentlemen, in attendance on the exhibition, were hospitably entertained at Mr. STONESTREET'S, where cordiality and good cheer well supplied the place of ceremony and extravagance, which are but too apt to unite for mutual display on such occasions.

When we took pen in hand, we did not expect to write more than a dozen lines, nor do we now know, for his "devil" who waits at our elbow, cannot tell us, whether the printer can make room for half we have said—so much the better for the reader and ourselves, if he cannot.

AGRICULTURAL SOCIETIES' CELEBRATIONS.

THE Maryland State Society, of which C. B. Calvert, Esq., is President, is to hold its next fair at Baltimore on the 10th, 11th, and 12th instant. Considering that it depends for its means and success on individual zeal and public spirit, too much could not be said in honour of its President and all his associates. The high position it has at once taken, goes to show again, how much may be expected from a few men of energy, when they represent and are supported by the good-will of an intelligent community. It is expected that the President and heads of departments will so far "venerate the plough" as to attend on the occasion; and, to say nothing of the fine exhibitions of practical agriculture and husbandry that may be expected to illustrate the most important of all the pursuits of industry, the annual address, to be pronounced by Senator Pearce, will of itself doubtless well repay all who may enjoy the enviable pleasure of hearing it!

The Hon. Joseph R. Ingersoll will deliver the discourse to be addressed to the Agricultural Society of Philadelphia, on the 5th instant. It cannot but be ominous of good for agriculture when we thus see men of distinguished talents coming forward to be enrolled on the list of its advocates. But how else could they be more honourably employed?

Mr. Skinner, Editor of "The Plough, the Loom, and the Anvil," has accepted an invitation to deliver the annual address before the Bucks County Agricultural Society, on the 5th instant, and may be expected to explain how it is, in his judgment, that these implements always work together for mutual benefit, and always suffer by wide separation.

SURVEY OF THE LINE OF THE POTOMAC RECOMMENDED.

Baltimore, September, 1849.

J. S. SKINNER:—*Dear Sir*,—I have delayed complying with my promise to furnish you with an essay on the iron trade and its manufacture, on account of the difficulty in procuring statistical and practical details, and have concluded for the present not to attempt an elaborate report, but to send you from time to time short articles on this and kindred subjects appropriate to the time and the occasion.

I commence this important and interesting subject by lamenting, that in Maryland and in Virginia we are without finished geological reports. You are aware that for several years the legislature of Maryland appropriated money for a geological survey, but the explorations scarcely reached beyond the regions of marl when the appropriations ceased. The reports were fruitless and of no avail for iron. In Virginia, the State geologist made considerable progress in his surveys, and his general results were annually reported to the legislature; but here, too, the appropriations were suddenly withheld, and as but few copies of the annual local reports were published, they are now out of print, and for want of a report containing a final summary, much labour and money are lost.

It would be well for you, in your own way, and at the time of the meeting of the respective legislatures, to call the attention of the members to this important matter. Great benefit would result to the public, and science would be promoted by a *final* report from Professor Rogers, of the University of Virginia, compiled from materials already in his hands.

The death of Professor Ducatel precludes the possibility of deriving similar results from his geological surveys in Maryland.

This brings me to a suggestion, to which I ask your personal attention and your personal influence.

The *Valley of the Potomac* presents a most important mineral region; or, rather it presents a cross section of many mineral regions. Commencing at the Chesapeake Bay and ascending the Potomac, we have the alluvial formations and the immense deposits of shell marl and green-sand marl in the diluvial, secondary, and tertiary formations. (Of these, I will speak on a future occasion.) Ascending, we meet the sandstone; then the primitive rocks above Georgetown—gneiss, granite, hornblende; the cellular quartz, containing gold; varieties of limestone, &c.

Approaching the mountains, we strike vast beds of iron-ore, and passing through the mountain ranges iron continues to be developed until we finally reach the great coal fields, which you have lately so appropriately noticed in your letter to Col. Thruston. Now let me remind you, that all this is common to both Maryland and Virginia. Geology pays no respect to geographical lines. The two banks of the Potomac are the same in a geological point of view. The mountains—the mineral strata—are all the same in either State. It is not even broken or interrupted; for the bed of the river is a continuance of the various strata. The Potomac, like many of the rivers of the Atlantic, bisects the mountain ranges at right angles. It is a curious fact. Some attribute it to an immense volcanic rupture by which the earth was opened, giving passage to the waters, but a close examination does not authorize such a magnificent performance. The small section of mountain has departed, but only to a suitable depth, and as the strata run parallel, the opposite faces would correspond and appear to fit without the necessity of parting asunder.

But let me not speculate, but return to the object of the present communication. A geological report of the valley of the Potomac would be of equal value to the two States. The rocks being denuded by nature, and further

exposed by the excavations of the canal and railroad, a perfect geological map could be constructed on the long line from the Chesapeake Bay to the Ohio river, and that map would be a reliable guide for the rock formations for many miles north and south of the line into the respective States. Let the following illustrate my meaning.

Gold is found in Alabama, Georgia, South Carolina, North Carolina, Virginia, and crosses the Potomac in Montgomery county, Maryland, where this precious metal is found as promising as in either of the other States. The cellular quartz which contains the gold, can be traced through this long line, running north-east and south-west in a general direction, parallel with the Atlantic coast and parallel with the mountain ranges, and at right angles to the river.

Now, it is to be presumed, that all the other strata of rocks and minerals follow the same law, and it is the business of geology to ascertain the facts, or report the exceptions, if any there be; and this line of the Potomac and the railroad extension developes the whole.

The same examination and report will make the public acquainted with the order of the strata, as regards the original horizontal arrangement, beginning with the granite and coming up to the coal formations and the sedimentary deposits. But again, I wander from the object of this letter.

The material is already in the hands of Professor Rogers. Once more passing over this line, he would be able to make a most useful and interesting report; and I claim your personal influence and your pen, operating on the legislatures of the two States, to induce them to contract with Professor Rogers for a geological report, extended to the source of the Potomac on the route of the Baltimore and Ohio Railroad, through Western Virginia to the Ohio River.

If your appeal fail, let the Chesapeake and Ohio Canal Company and the Baltimore and Ohio Railroad Company take it up. These corporations are deeply interested in the mineral developments on the right and on the left of these great works. The cost would be trifling; and information resulting from the report, and the enterprise it would inevitably create, would quickly remunerate those companies in the trade it would bring to them.

I have commenced the task you have given me, but let me urge you to the duty of rousing up some interest to procure a geological report of the great line which is soon to connect the Atlantic with the Western waters.

Yours respectfully, E.

NOTE BY THE EDITOR.—Most cheerfully would we use any measure of "personal influence" we might possess for a purpose of such great and obvious utility to the agricultural community; but a people must be educated up to a much higher point than are the masses of Maryland and Virginia, before they establish what every State ought to do—bureaux of agricultural statistics and authorize geological surveys. Such measures will be among the rich fruits of systems of education, better adapted to the pursuits and business of the classes who are now dazzled and content with every scheme to increase and diffuse military knowledge and the science of blood-letting, but who would not give a dollar to enable the farming community and their sons, on leaving school, to judge of the elementary constituents of their soil and the plants that grow in their fields—of the mechanical principles involved in the structure and hanging of a gate, or the form of a road, or a bridge, or the anatomy or diseases of a horse or a cow—no, not a dollar! Some demagogue of *party—no matter what party*—would denounce all such knowledge as not practical—as a whistle not worth its cost. Just as the meanest carrion-crow can pluck at the fairest fruit, so can such men denounce and render unpopular all plans to lay deeper and wider the foundations of useful, popular, *civil* intelligence. Quite otherwise, if you can give to your scheme a tinge or an odour of *blood!* How long has it been since men—farmers, we believe they lived in Carroll county—*petitioned the Legislature of Maryland against all expenditures for agricultural and geological surveys!* Will *somebody send us their names?* But a better time is coming. The people are beginning to throw off demagogues and to think for themselves. We shall see—shall we not?—at the next meeting of the Maryland State Agricultural Society some movement on this subject.

THE BREAD-FRUIT TREE.

THE earliest account of the Bread-Fruit is by Captain Dampier, in 1688. "The Bread-Fruit," says this navigator, "grows on a large tree, as big and high as our largest apple-trees; it hath a spreading head, full of branches and dark leaves. The fruit grows on the boughs like apples; it is as big as a penny loaf when wheat is at five shillings the bushel; it is of a round shape, and hath a thick, tough rind. When the fruit is ripe it is yellow and soft, and the taste is sweet and pleasant. The natives of Guam use it for bread. They gather it when full-grown, while it is green and hard; then they bake it in an oven which scorcheth the rind, and maketh it black; but they scrape off the outside black crust, and there remains a tender thin crust; and the inside is soft, tender and white, like the crumb of a penny loaf. There is *neither seed nor stone* in the inside, but all of a pure substance, like bread. It must be eaten new, for if it be kept above twenty-four hours, it grows harsh and choky, but it is very pleasant before it is too stale. This fruit lasts in season *eight months* in the year, during which the natives eat no other sort of bread kind. I did never see of this fruit anywhere but here. The natives told us that there is plenty of this fruit growing on the rest of the Ladrone Islands; and I did never hear of it anywhere else."

The scientific men who accompanied Captain Cook in his voyages, came home with the most enthusiastic ideas of the Bread-Fruit. Dr. So-

[Bread-Fruit Tree.]

lander calls it "the most useful vegetable in the world," and urges that no expense should be spared in its cultivation. The mere idea of bread, the most valuable food of man, growing spontaneously, was doubtless calculated to excite attention—almost, perhaps, as strongly as the subsequent description of the poet:

The Bread-Tree, which, without the plowshare, yields
The unreaped harvest of unfurrowed fields,
And bakes its unadulterated loaves
Without a furnace in unpurchased groves,
And flings off famine from its fertile breast,
A priceless market for the gathering guest. *Byron.*

But, after all, the Bread-Fruit Tree has not, hitherto at least, answered the expectations that were entertained. The Banana is more easily and cheaply cultivated, comes into bearing much sooner after being planted, bears more abundantly, and is better relished by the negroes. The mode of propagating the Bread-Fruit is not, indeed, difficult; for the planter has only to lay bare one of the roots, and mound it

with a spade, and in a short space a shoot comes up which is soon fit for removal.

Europeans are much fonder of the Bread-Fruit than negroes. They consider it as a sort of dainty, and use it either as bread or in puddings. When roasted in the oven, the taste of it resembles that of a potato, but it is not so mealy as a good one. [Penny Magazine.

[Bread-Fruit, Flower and Leaf.]

SUGAR, AND ITS EFFECTS ON MAN AND ANIMALS.

BY JAMES H. FENNELL,
Author of "A Natural History of Quadrupeds," &c.

SUGAR is one of the most ancient productions of India. Its European names, sugar, sucre, &c. are evidently derived from the Sanscrit *sukkhar*, and sugar-candy from *sukkhar-kund*. The cane is most extensively cultivated in the West Indies; and it was not until lately that it was introduced into the East Indies, but it has spread rapidly there, and the climate all over India seems perfectly adapted to it. The canes of the West Indies may be said to be almost wild and primitive, but those of the East Indies are really cultivated, and the great superiority of their Sugar affords an excellent proof of the importance of culture. When the cane had been introduced into Bourbon and Otaheite, the same superiority of the quality and quantity of the crops in comparison with those of the West Indies, on similar extents of ground, or from a like number of canes, was remarkable. Attention being called to this fact, the West India proprietors actually obtained the cultivated canes of Bourbon and Otaheite, and planted them to very great advantage about the close of the last century. In Affghanistan the cane thrives well, and yields an excellent Sugar, but the people are ignorant of the mode of crystalizing it, and therefore they are indebted to Hindostan for their large supplies of sugar-candy. The Affghans cut the fresh cane into small pieces, which they eat as sweetmeats. The cultivation of the cane has lately been introduced into the island of Singapore, and promises to become one of its most important branches of commerce.—Some French capitalists have purchased land at Algiers, on which they are growing it. In Sicily, Spain, and Italy, it was formerly cultivated, but, we believe, its culture is now abandoned in those countries.

Saccharine juice abounds in all the maples; and, in North America, where there are large forests of these trees, a very good sort of Sugar is extensively made from two species, though the black sugar maple is by far the least productive of the two. Pursh tells us that the Americans "obtain the juice by tapping the trees in spring; warm days and frosty nights are most favorable to the plentiful discharge of the sap. A hole is made in the tree in an ascending direction, with an auger, and a spout made of elder is introduced about half an inch, which projects from three to twelve inches. The sap will sometimes flow six weeks, accord-

ing to the temperature of the weather. Troughs are placed under the spouts to receive the sap, which is carried every day to a large receiver, from which it is conveyed, after being strained, to the boiler. Lime, eggs, or new milk are added to the sap, in order to clarify it; but clear Sugar may be made without any of these ingredients. The Sugar, after being sufficiently boiled, is grained, clayed, and refined, in the same manner as the sugar-cane in the West Indies.—The sooner the sap is boiled the better. It should never be kept more than twenty-four hours. The quality of maple sugar is superior to that which is made in the West Indies from the cane, and it deposits less sediment when dissolved in water. It has more the appearance of sugar-candy. The maple-sugar is, in fact, equal to any other Sugar, and is procured with little trouble." In the north of Europe, Sugar has been obtained from other species.

The traveler, Spencer, has given us an account of the Sugar which the Circassians procure from the walnut-trees that flourish in extraordinary perfection on the Caucasian mountains. During spring, just as the sap is rising, they pierce the trunk of the tree, and leave a spigot in it for some time. When the spigot is withdrawn, a clear, sweet liquor exudes, which they allow to coagulate, and sometimes they refine it. They sometimes use, as a substitute for Sugar, clarified honey, that has been perfectly bleached in the sun.

In France, the manufacture of Sugar from chestnuts is going on very promisingly. Some of the proceeds give fourteen per cent. which is above the mean proportion extracted from beet-root.

Professor J. F. W. Johnston says that the saccharine exudation that drops from the *Eucolyptus* of Van Diemen's Land is not a sort of manna as it was supposed to be, but a peculiar kind of sugar, which may be collected in considerable quantity. When crystalized from alcohol, it gave the same composition as grape sugar, but differs from it in relation to heat and other proper ties. The honey-dew, which exudes from limes and other trees, is of a saccharine nature, and Curtis says that if it could be procured in sufficient quantities it would serve well for Sugar. The Abbe Boissier de Sauvages has, indeed, described "a shower of honey-dew," which fell from a lime-tree in the King's garden at Paris. A correspondent of the *Gardener's Gazette* states that he had some beehives near a large wood of oak, where there was a honey-dew visible for thirteen successive mornings in August, and that each of these hives produced considerably more honey than those which were farther off.

Sugar has been obtained from the leaves of the ash tree, and from the stems of the birch tree, and of some species of plants.

The American cultivators of maize, or Indian corn, find that by bruising the stalks of this plant while immature, they can express an excellent Sugar. Mr. H. Colman tells us that they have already ascertained that more than 1,000 lbs. weight of sugar can be obtained from a single acre, and he has no doubt that double that amount would eventually be procured by proper cultivation and management, the manufacture being yet in its infancy.

It is well known that Sugar is yielded largely by the roots of carrots and beet. In Russia, there are upward of thirty beet-root Sugar factories in full operation. This manufacture is also thriving in Germany. A few years ago, Messrs. Fies and Slaneward, of Quedlinburg, Westphalia, discovered a process whereby, in twelve hours, ten pounds of pure Sugar, perfectly crystalized, may be extracted from 100 lbs. weight of beet-root. The secret was immediately purchased by M. Brokhoff, of Wisburg, for 20,000 francs, on condition that it should not be used beyond the Rhine and Westphalia. A beet-root sugar manufactory has been established in Essex; and, in 1837, some refined samples of English beet-root Sugar, of good quality and color, were sold in the London market at £5 per cwt. Mr. Rootsey states that forty tons of mangel-wurzel, raised upon a single acre, yielded three tons and a half of molasses.

Sugar extracted from pumpkins is equal in every respect to that from beet-root. Potatoes, wheat, barley, beans and peas, have also been made to contribute to the "sweets of life," and have been found to yield the greatest quantity while immature. A species of *Lamaria*, containing a considerable quantity of Sugar, is highly esteemed by the Japanese, as an article of diet, after it has been washed in cold water, and then boiled in milk.

Near the base, and on the upper surface of the ovary, in the flower of the *Rhododendron ponticum* there is a minute glandular spot, whence exudes a thick, clammy juice, which, on desiccation, crystalizes into pure white and transparent sugar-candy, and the crystals, thus naturally formed in the flowers, are sometimes found to be as much as three lines in length, especially in morbid specimens that have withered without fully expanding their petals. It is remarkable that Sugar is yielded in the greatest quantity by plants previous to their attaining perfection, or after they have had their flowers plucked off, or have had their assimilating powers affected by disease or injury. Even in the human being, suffering under certain morbid states, Sugar is found to be secreted by the system. In the *Medico-Chirurgical Transactions*, second series, vol. viii. Dr. Bence Jones has written on Sugar discoverable in the blood of persons laboring under the disease of diabetes, and it is well known to be pretty largely contained in their urine.

In all parts of the globe, mankind evince a fondness for Sugar, which, in many cases, proves wholesome to the constitution. Mr. Montgomery Martin observes that—

> A small quantity of Sugar will sustain life, and enable the animal frame to undergo corporeal and (as I can add from personal experience) mental fatigue better than any other substance. Often have I traveled with the Arab over the burning desert, or with the wild Afric through his romantic country, and, when wearied with fatigue and a noontide sun, we have set ourselves down beneath an umbrageous canopy, and I have shared with my companion his traveling provender—a few small balls of Sugar mixed with spices, and hardened into a paste with flour. Invariably have I found two or three of these balls and a draught of water the best possible restorative, and even a stimulus to renewed exertion. During crop-time in the West Indies, the negroes, although then hard worked, become fat, healthy and cheerful. In Cochin-China, the body-guard of the King are allowed a sum of money daily with which they must buy sugar-canes, and eat a certain quantity thereof, in order to preserve their good looks and *embonpoint*. There are about 500 of these house-

hold troops, and their handsome appearance does honor to their food and to their royal master. Indeed, in Cochin-China, rice and Sugar is the ordinary breakfast of people of all ages and stations; and they not only preserve all their fruits in Sugar, but even the greater part of their leguminous vegetables, gourds, cucumbers, radishes, artichokes, the grain of the lotus, and the thick fleshy leaves of the aloes. I have eaten in India, after a six months' voyage, mutton killed in Leadenhall Market, preserved in a cask of Sugar, and as fresh as the day it was placed in the shambles. In the curing of meat, a portion of Sugar is often mixed with the salt and saltpetre. The Kandyans of Ceylon preserve their venison in earthen pots of honey, and after being thus kept for two or three years its flavor would delight Epicurus himself. In tropical climates, the fresh juice of the cane is the most efficient remedy for various diseases, while its healing virtues are felt when applied to ulcers and sores. Sir John Pringle says the plague was never known to visit any country where Sugar composes a material part of the diet of the inhabitants. Drs. Rush, Cullen, and other eminent physicians, are of opinion that the frequency of malignant fevers of all kinds is lessened by the use of Sugar; in disorders of the breast it forms an excellent demulcent, as also in weakness and acrid defluxions in other parts of the body. Dr. Franklin found great relief from the sickening pain of the stone by drinking half a pint of syrup of coarse brown Sugar before bedtime, which he declared gave as much, if not more relief, than a dose of opium. That dreadful malady, once so prevalent on shipboard, scurvy, has been completely and instantaneously stopped by putting the afflicted on a sugar diet. The diseases arising from worms, to which children are subject, are prevented by the use of Sugar, the love of which seems implanted by Nature in them. As to the unfounded assertion of its injuring the teeth, let those who believe it visit the sugar plantations and look at the negroes and their children, whose teeth are daily employed in the mastication of Sugar, and they will be convinced of the absurdity of the statement.*

Dr. Willis imputed a corrosive quality to Sugar; but in disproof of this notion, Dr. Slare has related, in the *Philosophical Transactions*, No. 337, that his grandfather had, all his lifetime, been in the habit of eating, at his breakfast, a great quantity of Sugar spread upon his bread and butter, and that he used also to put Sugar into his ale and beer, and even into the sauce he ate with his meat. When eighty years of age, he had all his teeth strong and firm, able to crunch the hardest crust, and free from all pain or soreness in his gums. In his eighty-second year one of his teeth dropped out, and, soon after, he lost another, which was one of the front teeth: in fact, all his teeth dropped out in two or three years; but, what is most remarkable, they were replaced by the growth of a perfectly new set. His hair was at that time of a very white color, but it now became much darker. He enjoyed good health and strength, and died in the ninety-ninth year of his age.

The French people are great eaters of Sugar, always carrying some of it about with them in their pockets and reticules, and generally putting five or six large lumps into each cup of coffee.

M. Chossat reports that Sugar, when used as the *exclusive* or *principal* article of diet, produces quite opposite effects in some persons, according to the differences in their system; for, while it fattens some, it creates bile which induces a diarrhœa and a wasting of the solids in other persons. The celebrated Bolivar had, by fatigue and privations, so injured the tone of his stomach, that he was unable at times to take any other food than Sugar, which, in his case, was easy of digestion. His personal friends assure us that in some of his last campaigns he lived for weeks together upon sugar alone as a solid, with pure water as a liquid; but, probably, in nine hundred and ninety-nine cases out of a thousand, this diet would soon have brought the person adopting it to his grave; for, on those whose digestion is feeble, a large or exclusive allowance of Sugar adds to their grievance, because the excess of nutriment, not being generally absorbed by their weakened system, becomes converted to bile, and causes great debility and wasting of the body. In seventeen experiments made on dogs, M. Chossat observed that, when the sugar diet fattened them, there was a general tendency to constipation meanwhile; and, on the contrary, when it produces an excess of bile in other dogs, their bowels were relaxed. Why English children suffer in their digestion after eating largely of sugar-plums, comfits, &c. is chiefly owing, however, to those delicacies being composed of the refuse of starch-works, mixed with plaster of Paris, pipe-clay, or chalk, and having, indeed, as little Sugar as will suffice to give them a palatable sweetness, and they are often colored with gamboge, and sometimes with red lead, verdegris, and other mineral poisons.

Everywhere, the beasts of the field, the birds of the air, the reptiles, fish, and insects, are found to have a great liking for Sugar and honey. Mr. Martin says he has tamed the most savage and vicious horses with Sugar, and has seen the most ferocious animals domesticated by being partly fed upon it. The tamers of lions and tigers owe their power over them chiefly to a judicious use of Sugar and other sorts of sweets, and also of lavender-water, and various other perfumes, of which feline animals are remarkably fond. In the sugar season, in the West Indies, the horses, mules, and cattle soon acquire plumpness and strength by partaking of the leavings of the sugar-canes, after the manufacturer has done with them. In Cochin-China, the elephants, buffaloes, and horses are all fattened with Sugar. We learn from the "Memoirs of Dr. Edward Cartwright," (1843,) that that ingenious man used to fatten sheep on Sugar. To birds this diet proves so nourishing, that the suppliers of the European poultry-markets find that Sugar, along with hemp-seed and boiled wheat, will greatly fatten ruffs and reeves in the space of a fortnight.

[Jour. of Highland and Ag. Soc. of Scotland.

HORTICULTURAL EXHIBITION.

BY T. MACKELLAR

WITHIN old Eden's walls methinks I stand,
While sin is not, and innocence and love
Make earth the counterpart of realms above,
And streams of joy flow through the happy land.
The blooming beauties of earth's varied climes
Together here in sisterhood have met;
Their Latin names would spoil my Saxon rhymes,
Else, I might have them here in order set.
These fruits and flowers of every shape and hue,
And bees, and honey in its virgin comb,
And peaches, pears, plums, grapes, and apples too,
I fain could wish were safely at my home.
Oh that an Eve would wander near my seat,
And bid me rise, and freely pluck and eat!

* History of the British Colonies, vol. ii.